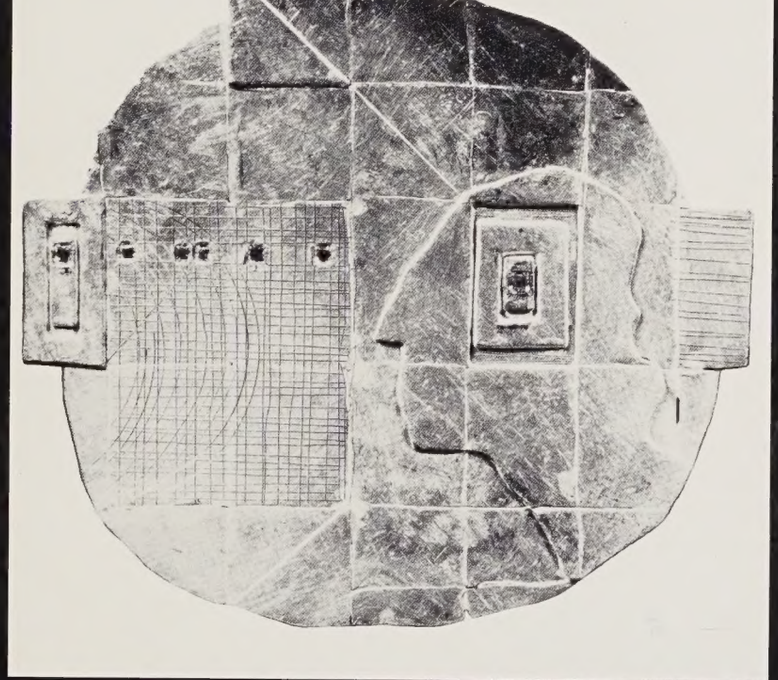
Metalsmith

fall/82 volume two, number four $5.00

Scandinavian Metalwork
Ancient Craft of Granulation
Jewelry Design: Art and Profession
National Ornamental Metal Museum
Donald Stuart: Weaver and Metalsmith

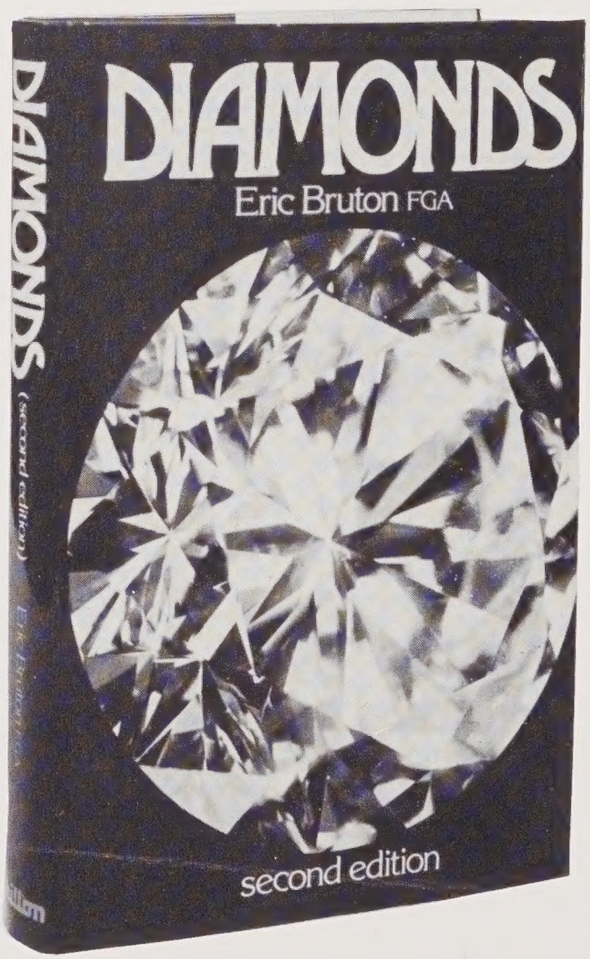


available now through the

Jewelers' book club

BRAND NEW EDITION

Now Available! A Bigger, Better Edition of One of the Most Captivating Books on Gems Ever Written.



NEW! Completely revised and updated . . . includes fascinating material never before published.

By Eric Bruton, Editor – publisher of Retail Jeweler in England and former editor of The Gemologist and Industrial Diamond Review.

Diamonds has been called by many the most comprehensive source of up-to-date information ever published on the intriguing – and very lucrative – subject of gem diamonds. Now in over 530 crisply written vividly illustrated pages, internationally renowned gemologist Eric Bruton combines the fabulous history and lore of the diamond industry with the kind of solid practical information that professional jewlelers need to know. Diamonds is an encyclopedia of invaluable knowledge and business profit potential, covering everything from prospecting, mining, and cutting methods to grading and pricing polished diamonds, investment and advice on spotting simulants.

There are over 500 pictures and drawings, including 16 color plates, illustrating, among other things, different cuts, color and clarity scales, and the estimating of weight by dimensions. The book also contains four appendices listing the world's largest rough and polished diamonds.

Diamonds is a truly invaluable reference, a hardbound gem that belongs on every jeweler's bookshelf. $25.00

Order your copy today through the Jewelers' Book Club

Return this order form and your remittance to: Jewelers' Book Club, Jewelers' Circular-Keystone, Chilton Way, Radnor, Pa. 19089

Please send me _____ copies of DIAMONDS (second edition: first edition no longer available), by Eric Bruton, @ $25.00 per copy. I enclose a check for $_____ to cover the full amount of this purchase, including my state sales tax.

_____

(name) (company)

_____

(street address)

_____

(city) (state) (zip)

Mail Check and Coupon to:
Jewelers' Book Club, Jewelers' Circular-Keystone
Chilton Way, Radnor, Pa. 19089

I-M

League of N.H. Craftsmen

Seminar 83

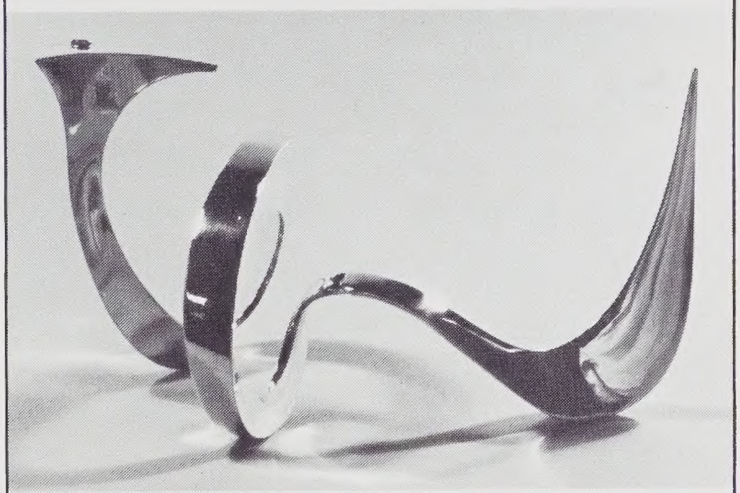
ADVANCED
STUDIO
WORKSHOPS

Sharon, New Hampshire
January 11-15, 1983

John Steiner: *Design for Crafts*
Sallie O'Sullivan: *Weaving*
Byron Temple: *Ceramics*
Jean Ray Laury: *Quiltmaking*
George van Duinwyk: *Advanced Stonesetting*
Dorothy Hamblett: *Woodgraining/EAD*

League Office:
205 North Main St.,
Concord, NH 03301

Heikki Seppä



September 13—October 19
Organized by Joel Bagnal

TEN ARROW

10 Arrow Street
Cambridge, Ma. 02138
617 876-1117

Hallmark for Professionals, An F.I.T. Jewelry Design Education

Developing technologies and industrial expansion require that the jewelry industry of tomorrow be able to draw upon men and women with professional training for the careers it encompasses. The Jewelry Design curriculum at the Fashion Institute of Technology is a comprehensive one, with courses that familiarize students with all areas of the jewelry industry, as the foundation for a career as a designer, jeweler, or executive in the manufacturing of jewelry. Upon successful completion of the two-year program, students are awarded an A.A.S. degree. The faculty of the Jewelry Department comes directly from industry and includes some of the most knowledgeable and best-known names in the field. F.I.T. maintains a full-time, year-round Placement Office which functions for undergraduates, for recent graduates, and for alumni for five years after graduation. Fashion Institute of Technology/A State University of New York, specialized college in Manhattan/ Publicly supported low tuition/Financial Aid is available/Two dormitories on a large modern campus/Extensive student activities program/Division of Continuing Education: evening, summer and "winterim" programs.

Write or phone for information
Dean of Students
Fashion Institute of Technology
227 West 27th Street
New York, N.Y. 10001
(212) 760-7681

Name _____ *M*

Address _____

City, State, Zip _____

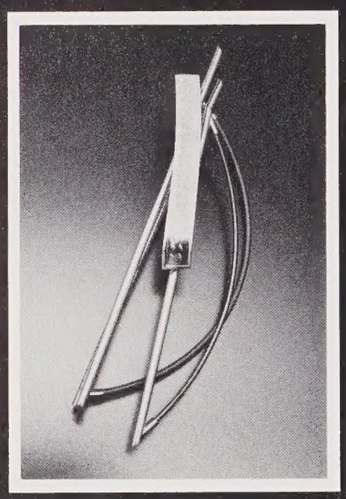
I'm interested in:

day _____ *evening* _____ *summer/winterim* _____

HELEN SHIRK

EDWARD DE LARGE

OCTOBER 24 — NOVEMBER 27, 1982



HELEN SHIRK
BROOCH 2½" x 4"
SILVER, TITANIUM

EDWARD DE LARGE
BROOCH 1½" x 1½"
TITANIUM AND SILVER

HELEN DRUTT

HELEN DRUTT GALLERY
305 CHERRY STREET
PHILADELPHIA, PA 19106

(215) 735-1625

Metalsmith

fall/82 volume two, number four

Metalsmith

CoEditors/Mark Baldridge, Sarah Bodine
Design Director/Martin Moskof
Design Assistant/Susan Gravdahl
Circulation/Bob Mitchell
Contributing Editors:
Jennifer Place
Bruce Metcalf
Paula Dinneen
Bernard Bernstein
Robert Cardinale
Elizabeth Skidmore Sasser
Special projects/Harry Dennis

Society of North American Goldsmiths
President/Arline Fisch (1984)
Vice President/Michael Croft (1984)
Secretary-Treasurer/
Douglas Steakley (1983)

Board Members
Mark Baldridge (1983)
Richard Helzer (1984)
Marcia Lewis (1986)
Linda Threadgill (1986)
Gary Griffin (1984)
Richard Mawdsley (1985)

Published quarterly by the Society of North American Goldsmiths (SNAG), a nonprofit organization, 2849 St. Ann Drive, Green Bay, WI 54301. Annual membership rates, which include a subscription to *Metalsmith*: $75 for Distinguished Members, $45 for Members and Institutions, $30 for Students.

Address membership and subscription inquiries to: Bob Mitchell, SNAG, 2849 St. Ann Drive, Green Bay, WI 54301. Claims for missing issues only accepted if received within four months (USA, Canada, Mexico), elsewhere six months, Address advertising inquiries to: Harry Dennis, 15 West 44th St., New York, NY 10036. Telephone (212) 840-2866.

Contents copyright © by SNAG and may not be reproduced in any manner or form without written permission.

ISSN 0270-1146.

Second class postage permit at Clinton, OH and additional mailing offices.

Address editorial material to Sarah Bodine, Editor, 35 West 84th Street, New York, NY 10024. Unsolicited manuscripts and photos will be handled with care, but the magazine assumes no responsibility for them. All material must be accompanied by a self-addressed, stamped envelope. The opinions expressed in *Metalsmith* are those of the authors and do not necessarily represent those of the trustees of SNAG or the staff of *Metalsmith*.

Metalsmith is partially supported by a grant from the National Endowment for the Arts

Printed by Eastern Press, New Haven, CT

Postmaster: Send address changes to *Metalsmith*, 2849 St. Ann Drive, Green Bay, WI 54301

Features

Excellence by Design: Metalwork from Scandinavia
by David Revere McFadden — 7

Jewelry Design: The Art and the Profession
by Alfred Durante — 14

Donald Stuart: Weaver and Metalsmith
by Gail Hook — 17

The Ancient Craft of Granulation
by Jochem Wolters — 20

The Artist's Role in a Technological World
by Peter Moss Handler and John Day Pirtle — 26

On View — 29

Jim Wallace and the National Ornamental Metal Museum
by F. Jack Hurley — 35

The Shidoni Foundry and Gallery
by Elizabeth Skidmore Sasser — 39

Roger Millar: Scottish Metalsmith and Teacher
by William Ard — 42

Departments

Letters to the Editor — 6

Metals for the Metalsmith: Powder Metallurgy
by Aggie K. Beynon — 52

Health Hazards: Questions & Answers
by Linda Weiss-Edwards — 53

Exhibition Reviews

Reinhold Reiling
by Ann Grundler — 44

Bruce Metcalf
by Joanne Calve — 44

Enamel Today
by Ramona Solberg — 45

National Metals Invitational
by Trudy Berman — 46

Metalwork 1982
by Shelly Guggenheim — 46

Gabriel D. Ofiesh and Lee Angelo Marraccini
by C. James Meyer — 47

Innovations/Craft 82
by Tim McCreight — 47

Production Lines: Art/Craft/Design
by Karl Bungerz — 47

Komelia Hongja Okim
by Gretchen Klunder Raber — 48

Scrap Metal
by Antonia Schwed — 48

James B. Evans
by Jennifer Place — 49

EOMMEX Jewelry Show
by Anne Barros — 50

The Maker's Eye
by Barbara Young — 50

Medieval Limoges
by Barbara Young — 51

Editorial

For years it has been suggested that our college and university jewelry/metal programs are not sufficiently preparing students for a career. Now, as teaching jobs become almost nonexistent, new fuel has been added. This problem is confined to the United States, where most art programs are incorporated in the university structure. While many instructors may correctly argue that it is not their responsibility nor mandate to teach vocational training, students will be the ones to suffer.

In actuality, a high percentage of jewelry/metal instructors in the United States are incapable of training their students to make a living from their work. Of course, these instructors are simply products of their own education where no emphasis was placed on jobs. In fact, schools do not require this background. Part of the problem lies with schools that will not allocate money for equipment, workshops or faculty training; part of the problem lies with students enrolling in a college instead of a trade school; and part of the problem lies with instructors who do not have sufficient background in production techniques.

Many instructors feel that art should be done purely for the sake of art. This ivory-tower attitude is mirrored in the large, unwearable, unsalable art jewelry being produced in American schools. While creative thinking may evolve from it, it also breeds shortsightedness. Perhaps many of us are too close to take a realistic look at what is being produced. It was interesting to read Edward de Large's assessment of this United States "academic jewelry" phenomenon in British *Crafts* magazine (No. 52, Sept.-Oct. 1981, p. 49). De Large argues that the imperfect mastery of skills in America combined with the use of a variety of media in one piece produces sometimes unfortunate results. Lately the problem has been further complicated by a trend to nonfunctional sculpture. While this is a valid artistic direction, I find the number of students who are actively involved in it in lieu of basic metal/jewelry techniques disturbing. What will happen to them upon graduation? When a firm hires a goldsmith, it expects a goldsmith, not a sculptor. A student so involved with sculpture should perhaps consider changing majors.

Unfortunately, most of the students' role models are well-established academic jewelers who can afford the luxury of artistic freedom, expression and experimentation. If, indeed, we are interested in influencing thoughts, tastes and values toward metal/jewelry, then we need to prepare our students to this goal. Producing goldsmiths who are forced to make their living from waiting on table, working on automobiles or selling vegetables does not accomplish this; producing actively involved metalsmiths does.

I do not wish to imply that we should not place strong emphasis on art and design; most commercial jewelry proves their need. But somewhere there is a happy medium between art and commercial jewelry. Artists who discover this combination will reap the financial rewards that their art can bring.—MB

We report with great sadness the death of Marty Neumann, who served the Society of North American Goldsmiths and *Metalsmith* for many years as business secretary, circulation manager and behind-the-scenes catalyst and supporter.

Cover: Reinhold Reiling, *Brooch, gold, diamonds, 1969.* Photo: courtesy Schmuckmuseum, Pforzheim, Germany

Hummingbird

"where jewelry is fine art"

32 East Market Street
Rhinebeck, N.Y. 12572
(914) 876-4585

JEWELRY CLASSES

Comprehensive & Specialized Courses

- Hard Soldering
- Electro-Plating
- Enameling/cloisonne
- Wax modelling
- Casting/Mold Making
- Stone Setting
- Jewelry Repair
- Polishing/Buffing

Beginners and Advanced Students
Flexible class hours / Open 7 days a week / Bench Time Available

FREE INTRODUCTORY LESSON
Individual and Small Group Instruction
32 East 31 St. New York, N.Y. 10016 (212) 686-1944

STUDIO JEWELERS, LTD.

ARTWEAR

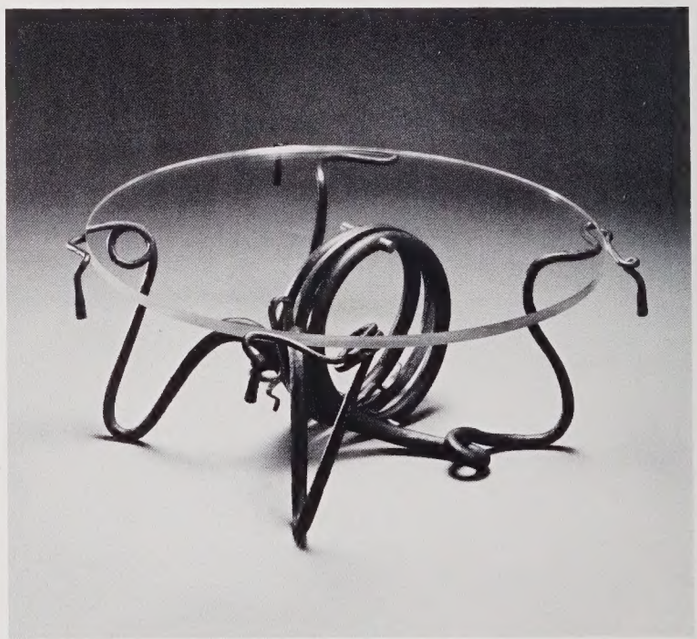
409 WEST BROADWAY NYC 10012
212/431-9405

©SHARON CHURCH 1982
NECKRING: PURPLEHEART, PADAUK, MAHOGANY
photo: Mark McCarty

concepts

NEW JEWELRY BY SHARON CHURCH
OCT. 15-NOV. 20

concepts • 6th & mission • carmel, california



THOMAS R. MARKUSEN
METALSMITHING STUDIO

Designs in: Copper, Brass, Nickel, Silver, Gold and Steel. Specializing in production and limited editions, custom design and one-of-a-kind metalwork. Featuring candleholders, planters, vases, lamps, clocks, holloware, furniture, and ornamental ironwork.

For brochure and price list write:
Thomas R. Markusen
17218 Roosevelt Hwy., Kendall, N.Y. 14476
(716) 659-8001

Missing Issues

If for any reason you do not receive your issue of *Metalsmith* within three weeks of the publication date, please notify our business office: Society of North American Goldsmiths, 2849 St. Ann Drive, Green Bay, WI 54301. Do not address these inquiries to the editorial offices, as this will delay processing. Thank you.

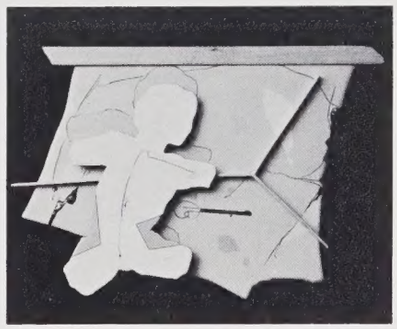
GALLERY OF CONTEMPORARY METALSMITHING
Nov. 20 - Jan. 8

artists

Pat Flynn
Jim Cotter

Rochester, N.Y. 14614
(716) 546-1224

Boston University
Program in Artisanry
for the education of professional artist-craftsmen



Jamie Bennett, faculty
enamel wall piece, 7" x 9"

fiber, ceramics,
metal and jewelry design,
historic stringed instruments,
woodworking and furniture design

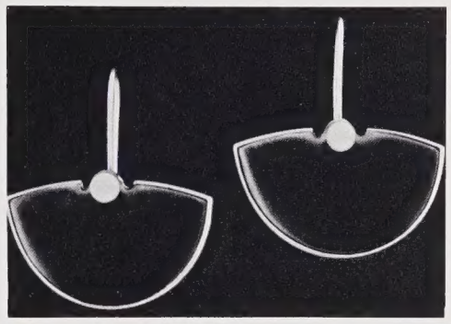
Graduate, undergraduate, and special programs
Summer and evening courses
Graduate teaching assistantships and merit awards

Program in Artisanry
Boston University, Dept. M
620 Commonwealth Avenue
Boston, MA 02215
617/353-2022

Boston University is an equal opportunity institution.

PAMELA ALLMAN JEWELRY
813-756-8803

Ars
R.R.2, Box 23A
High Falls, N.Y. 12440
(914) 687-7408



Announcing
SNAG Annual Conference
June 8-12, 1983
Asilomar Conference Grounds
Pacific Grove, California

For Information Contact:
Douglas Steakley, Conference Coordinator

P.O. Box 736
Carmel Valley, CA 93924
408-659-4346

Letters to the Editor

Many letters received are of interest to the entire readership. Unless stated otherwise, all letters received may be included in the "Letters to the Editor" section. Address letters to the editor to: Sarah Bodine, Editor, Metalsmith, *35 West 84th Street, New York, NY 10024. Letters should be signed and a return address given. The editors reserve the right to edit for publication.*

Dear Editor:
It is obvious that Mr. Harper's conceit leads him to believe that all the literature on the art of cloisonné must be directed toward his needs. *Cloisonné, The Art of Cloisonné Enameling and Jewelry Making* by Felicia Liban and Louise Mitchell (reviewed Fall 81), deemed worthy enough for publication by Chilton Book Co., was obviously not written with Mr. Harper in mind.

The Liban-Mitchell book was intended to introduce to the professional jeweler and craftsperson the particular techniques involved in the preparation and setting of a perfect nonpitted cloisonné. For this reason the authors present a step-by-step procedure that can easily be followed to develop this technique. Once the basics are mastered the authors assume that artists are free to adapt the knowledge within the bounds of their creativity. Creativity cannot be taught and no artist can be inventive or creative until he has mastered the techniques of his chosen art form.

As an amateur jeweler and enamelist I was able to follow and master the procedures delineated. I am now putting my own ideas of form and color into the technique.

Mr. Harper seems to have a vendetta against the Kulicks and is taking it out on the authors. This book should be reviewed again by an impartial person.
—Doris Trevas

Dear Editor:
This letter concerns William Harper's book review of Liban and Mitchell's book *Cloissoné* (Fall '81) and William Jacobs's letter (Spring 82). If a person does not understand the statement, they can't make an intelligent rebuttal. By "drawing technique," Harper meant that the drawing and designs used in an art-craft book should not offend the eye. No justice is done to enameling when it is reduced to the level of "paint by number." Harold B. Helwig used different words, but basically gave the same critique of the book in "Glass on Metal," vol. 1, no. 1, Jan. 82.
—Kathryn Regier Gough

Dear Editor:
In addition to the N.E.A. Fellowship grants awarded to members of the Society of North American Goldsmiths, money was granted under Services to the Field for a collaborative project to research bonding techniques. This involves joining similar and dissimilar materials (such as glass to metal) utilizing industrial methods. Mr. William Kline, an industrial bonding expert and I are designing equipment, developing processes and techniques applicable to the studio artist. We hope to publish the results at a later date in *Metalsmith.*
—Vada C. Beetler

Ed. note: Metalsmith magazine was also the recent recipient of an N.E.A. Services to the Field grant for circulation and editorial.

Dear Editor:
Like many other art and design college graduates I left school with a false sense of ability, certain that people would flock to me for my particular design offerings in metal. Once in the real world and faced with making a living by my craft, it became obvious that people did *not* flock to a designer/craftsman for custom-made jewelry. It was also obvious that I was running into technical problems which I was not yet ready to handle. Even with this realization I continued as a designer/craftsman for four years, at which time I was forced to turn to the security of the commercial work force where I came into contact with the opposite of the metal arts world—the jewelry trade world. I call them "worlds" because they are completely different in attitudes and approaches.

In the arts, metal is a medium of expression; in the trades, metal is an expression of money. Artists take time to develop and execute a design; in the trades, time is money. In the arts, design is all important; in the trades, you take pride in work well done even if the design is an abomination. In the arts, you design around your abilities; in the trades, you have to deal with any technical problem thrown your way.

Because of my dual life as a trade jeweler by day and a designer/craftsman by night, I have developed the opinion that it is the designer/craftsman's responsibility to execute his/her designs in as technically perfect a form as possible so that everything works and stays working. If you do not understand methods of construction, you create unusable pieces and achieve results short of your (and your customers') expectations.

An earring, for example, which is beautiful on its own, becomes junk drawer fodder if a misplaced, out-of-proportion earwire renders it unwearable. All the effort of designing is lost. It is lost also on the bracelet with a barely functioning clasp that is too weak to stay closed.

It is a designer/craftsman's responsibility to know how to make size adjustments to his/her own designs. Every metal craftsman should know how to make rings larger or smaller, with stones or without, in gold or silver or whatever. It is the designer/craftsman's responsibility to know how to repair a ring that was accidentally stepped on or chewed by the family dog. After all, you created it and it's up to you to know how to fix it.

"Now," you may well ask, "where am I going to learn to deal with all these responsibilities?" I feel that the obvious place is in college. It is the colleges' responsibility to teach these all-important technical skills as well as design awareness and sensitivity. This could possibly be done by developing some form of apprenticeship system with the trades or by bringing tradesmen into the colleges as educators.

If the colleges cannot change their approach, they could at least make their students more aware of what will be expected of them once they start earning a living by their craft. The serious ones will then fill in the educational gaps on their own.

The educational system must start to ensure a greater level of expertise. We cannot go on churning out people who hide their inabilities behind the guise of being "elite artists."
—Myra Tulonen Smith
Myra Tulonen Smith is a goldsmith working in the jewelry trade in Ottawa, Ontario, Canada. This letter first appeared in CraftNews *(May, 1982) published by the Ontario Craft Council.*

Dear Editor:
Metalsmith has become very valuable to me as a way to relate to the "metalsmithing world" now that my school days are over. I found the information in the article "Artists in Metal" to be exciting and would like to see this approach taken in other cities. The topics I would like to see investigated in future issues of *Metalsmith* are: the crafts cooperative and grants/aid to the craftsperson, both specifically geared towards metalsmiths/jewelers.

Thanks for addressing the issue of emotional and financial survival as a metalsmith—keep it up.
—Wendy Bergman

Dear Editor:
In reference to Tom Arnold's article on retipping (Winter 82)—very good article; I'm glad to see this kind of article in the magazine. But a large corundum, i.e., ruby and sapphire, will crack with direct heat. Please tell your readers this before it costs somebody some money.
—John Caro
Gold Dust, Inc., 122 Main St.,
Annapolis, MD 21401

Dear Editor:
I want to congratulate you on the excellence of your publication. I was thoroughly inpressed by the level of seriousness you aim for and attain; by the quality of both visual and verbal content; by the overall design—layout, typography and separation of advertising from editorial material.

Your efforts affirm that commitment to high standards of magazine production need not be compromised by the absence of color.

As a writer on crafts in various media, I would find it invaluable to have access to *Metalsmith* on a regular basis. I am therefore making use of the subscription form included in the magazine.
—Patricia Malarcher

Dear Editor:
Congratulations on another excellent issue of *Metalsmith,* a truly fine publication; our library copy is always "in use." Enclosed is our summer catalog for your reference.
—John I. Russell, Executive Director
Brookfield Craft Center

Excellence by Design: Metalwork from Scandinavia

by David Revere McFadden

The 20th century has been a period of vital and rapid change in the fields of craft and industrial design. The Scandinavian countries have been among the most influential forces in the development of an international vocabularly of design esthetics; and a special and fortuitous combination of talent, taste and technological expertise has assured Scandinavian design a strong and resonant voice in this international community. Designers from Denmark, Finland, Iceland, Norway and Sweden have contributed significantly to the growth of modernism, the worldwide appeal of their designs resulting from a distinctive approach to materials and techniques that mark their creative efforts as unique.

From September 14, 1982 through January 2, 1983, the Cooper-Hewitt Museum is hosting a special exhibition entitled Scandinavian Modern: 1880-1980 *that surveys the history of Scandinavian design during the past century, with particular emphasis on the fields of ceramics, glass, furniture, textiles and metalwork. Within the over 330 objects selected for this exhibition are included 80 examples of Scandinavian metalwork, representing both the studio traditions and industrial production. The metalwork designs document the progression of styles and the work of leading designers that have played a significant role in the growth of modernism.*

From the late 19th century are included Viking revival works in silver and gold that evoke the dramatic ornaments and forms of early culture in Scandinavia. The sense of pride in national traditions expressed in these works and the interest in virtuoso techniques form a basis for later developments in the Nordic countries. The challenging years of industrial development in the early 20th century likewise affected metalwork design, encouraging many designers to exploit industrial processes to achieve new functional and esthetic goals. The exhibition also provides insight into the current design situation in Scandinavia, with particular emphasis on the vibrant renewal of studio crafts as well as industrial mass production. Throughout the decades, metalwork design in Scandinavia stands as a symbol of the necessity of change, as well as the mandate of design excellence that has distinguished this tradition. The following are selected examples of metalwork spanning the century covered by the exhibition.

The exhibition, organized by the Cooper-Hewitt Museum, is accompanied by a fully illustrated catalog Scandinavian Modern Design 1880-1980. *After January, 1983, the exhibition will travel to the Minnesota Museum of Art at Landmark Center, February 27-April 24, and to the Renwick Gallery, Washington, D.C., July 8-October 10. David Revere McFadden is Curator of Decorative Arts at the Cooper-Hewitt Museum.*

Torolf Prytz (1856-1938)
Norway
Jardiniere, 1900, produced by
J. Tostrup, Oslo
Silver; 35 x 53 cm
Collection of Oslo
Kunstindustrimuseet

F.W. Knoblich (1808-1879)
Denmark
Brooch, 1870,
produced by A. Michelsen,
Copenhagen
Gold; 3.5 x 7.5 cm
Collection of Det Danske
Kunstindustrimuseum,
Copenhagen

The origins of modernism in Scandinavian metalwork design emerged in the renewal of interest in the ancient cultures of the Nordic lands. Viking revival designs symbolized the search for new traditions that incorporated a national ethos; the most dramatic of these appeared in goldsmiths' and silversmiths' work. Many Viking revival designs were based on actual archaeological material unearthed during the 19th century, but they also indicated a new appreciation of virtuoso techniques of fabrication and the skillful adaptation of these techniques to the esthetic requirements of the modern world. F.W. Knoblich's brooches are noteworthy for their incorporation of filigree and granulation, creating a delicate texture on the surface of a simple and virile form. Torolf Prytz's silver jardiniere suggests a more imaginative approach to Viking-style ornament, its shape recalling the bold architecture of Viking ships. Originally intended to be shown at the Exposition Universelle in Paris in 1900 (unfortunately not completed in time), the jardiniere speaks eloquently of the poetic grandeur of tradition and a new sense of national pride that would guide design in the 20th century.

Arthur David-Andersen (1875-1970) Norway
Ewer, 1901-04
Silver; 29.5 cm (height)
Private collection, Norway

The gentle and rhythmic patterns of Continental Art Nouveau were absorbed into the mainstream of Scandinavian design during the late 19th and early 20th centuries, flourishing with particular vigor in leading centers of design such as Oslo and Stockholm, Arthur David-Andersen, son of the founder of the David-Andersen firm of silversmiths, was an early exponent of the graceful "Jugend" style, his work distinguished by the delicacy of the chased patterns. The ewer is of a pleasingly simple shape, the gentle curves of the body and lip echoed by the repoussé iris blossoms. Although a relatively short-lived style in Scandinavia, Art Nouveau reawakened an interest in ornament based on indigenous natural forms, providing a new repertoire of motifs that found great favor among silversmiths.

Georg Jensen (1866-1935)
Denmark
Cutlery "Continental" pattern, designed 1906
Silver; 19.4 cm (length of spoon)
Courtesy Georg Jensen Sølvsmedie A/S, Copenhagen

Few designers from the turn-of-the-century achieved the international recognition enjoyed by Georg Jensen, founder of one of the most successful silver manufacturing firms in Scandinavia. With a particularly sensitive attitude toward the soft and responsive metal, Jensen created designs that were both timely and timeless. Although many of Jensen's design incorporate stylized organic ornament as fully modeled sculptural details, other designs, such as the "Continental" pattern flatware, are strikingly functionalistic. The design for the flatware relies entirely on a softly modulated and reflective surface, simple shapes and stark parallel lines that create an abstract pattern on each piece. The utter simplicity of the pattern contrasts to the more ponderous styles of the same time, and this pattern is still in production today.

Jacob Ängman (1876-1942)
Sweden
Coffeepot, 1917-18
Silver; 19 cm (height)
Collection Röhsska
Konstlöjdmuseet, Göteborg

One of the leading figures in Swedish silver during the early 20th century, Ängman produced designs of sophisticated elegance and rationality. He combined functionalist principles with the refined techniques of the master silversmith; forms were often based on geometric principles, but softened through the introduction of seductive curves. Each segment of the body is carefully delineated, while the gentle curvature of spout and handle are echoed in the subtle interplay of the faceted body and cover. Trained in a traditional silversmith's workshop, Ängman rapidly rose to prominence as the director of the Guldsmedaktiebolaget in Stockholm, working alongside distinguished architects such as Gunnar Asplund (notably on St. Peter's Church in Malmö).

Oskar Sorensen (born 1898)
Norway
Liqueur Decanter, 1937,
produced by J. Tostrup, Oslo
Silver; 27 cm (height)
Collection of Oslo
Kunstindustrimuseet

Ornamental designs of the 1930s often reflected functionalist principles that were incorporated into highly decorative shapes. This decanter, in the form of a singing bird, is strikingly "streamlined" and geometric, creating an abstract sculptural form based on the interplay of geometric planes and shapes. Sorensen's designs were often produced in multiples by the Tostrup firm of Oslo, although his work as a designer of metalwork was by no means restricted to silver. Among Sorensen's specialties was the design of aluminum products for mass production, in which the designer brought his creative intelligence to bear on domestic utensils and products created through spinning and die-pressing techniques.

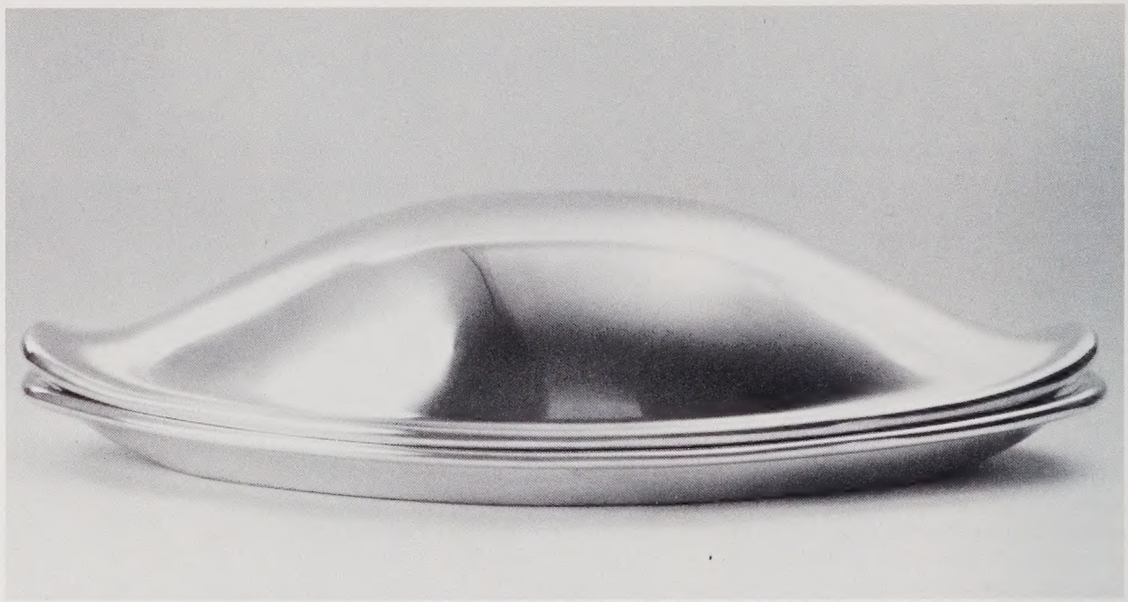
Arne Jacobsen (1902-1971)
Denmark
Cutlery "AJ" pattern, designed 1957, produced by A. Michelsen, Copenhagen
Stainless steel; 20 cm (length of spoon)
Courtesy A. Michelsen A/S, Copenhagen

The sleek and refined designs of mid-century are probably best expressed in the striking "AJ" cutlery designed by the internationally recognized architect and industrial designer Arne Jacobsen. A multi-faceted designer, Jacobsen was trained as an architect, and a strong sense of structural form was embodied in his metalwork and furniture. This flatware pattern was originally designed to be fabricated from stainless steel, rather than being adapted from a silver model. The stark simplicity of shape and absence of extraneous ornamentation have made the pattern a classic of mid-20th century design.

Bent Gabrielsen (born 1928)
Denmark
Necklace, designed 1952, produced from 1959 by Georg Jensen, Sølvsmedie, Copenhagen
Silver; 16 cm (diameter)
Courtesy Georg Jensen Sølvsmedie A/S, Copenhagen

This simple and elegant necklace typifies the mid-century esthetics of Danish jewelry designers. In addition to the sculptural strength of the design, the necklace relies on an unusual interlocking system of parts that allows maximum flexibility while in use. The design was exhibited at the 1960 Milan Triennale, where it was awarded a gold medal. Gabrielsen has combined the roles of studio artist and production designer; many of his commissions have been for unique pieces of jewelry and for ecclesiastical services, while he has provided a number of designs for manufacturing firms such as Georg Jensen of Copenhagen and Hans Hansen of Kolding.

Henning Koppel (1918-1981)
Denmark
Covered Fish Dish, designed 1954, produced by Georg Jensen, Sølvsmedie, Copenhagen
Silver; 17 x 63 x 32 cm
Courtesy Georg Jensen Sølvsmedie A/S, Copenhagen



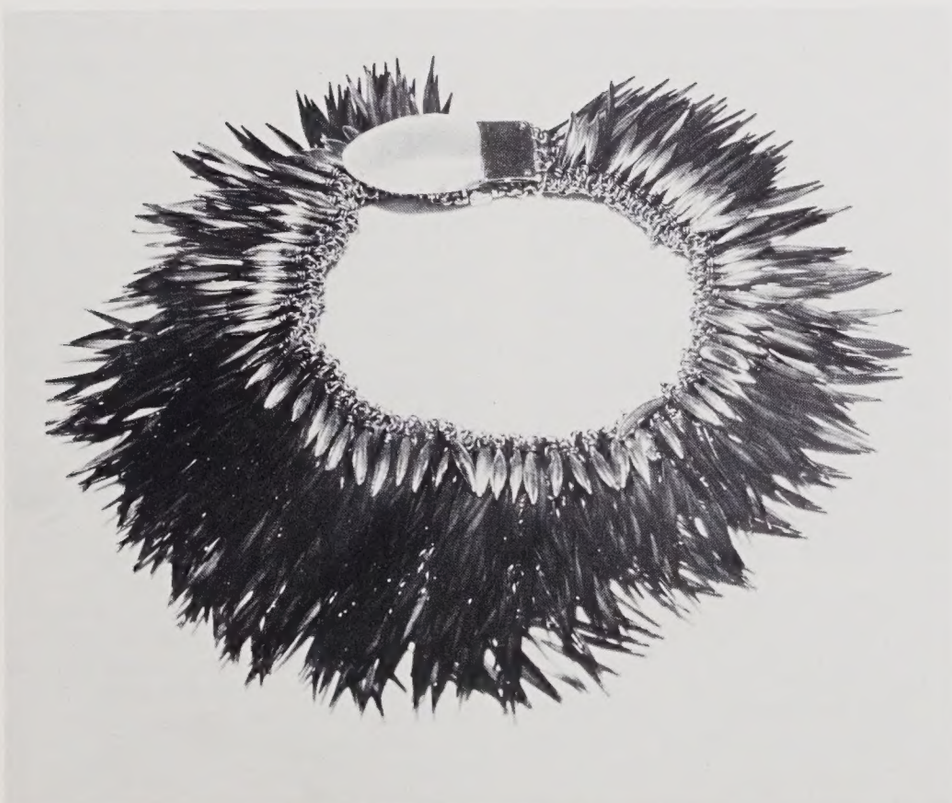
Erik Magnussen (born 1940)
Denmark
Thermal Carafes, 1976, produced by Stelton A/S, Gentofte
Stainless steel, plastic; 30 cm (height)
Courtesy Stelton A/S

Koppel's sensitive organic forms represent a high water mark in Danish design around the mid-20th century, and this covered fish dish has been recognized as a classic in the designer's career. Koppel began his work for Jensen in 1945, and continued to provide designs for the firm until his death in 1981. During his career he also designed glass for Orrefors and ceramics for the Bing and Grøndahl firm in Copenhagen. The gentle curves of this dish suggest the origins of the design in sea life, but without any literal reference to the natural forms. The beautifully finished surfaces of the work emphasize the softly organic shape, creating a series of reflections that echo the sinuous sculptural form.

A new generation of metalwork designers in Scandinavia are devoting their efforts to industrial production, and among them Erik Magnussen has achieved international reknown. The thermal carafe was designed to meet rigid functional requirements—maintaining the temperature of the contents, ease of pouring and ease of maintenance. These goals have been achieved within a design that is astonishingly straightforward and practical. Magnussen's designs are distinguished by his radical simplification of elements to a series of coherent geometric forms. Their visual strength arises from eloquent understatement, making them ideal for industrial manufacturing techniques.

Jan Lohmann (born 1944)
Denmark
Brooch/Comb, 1978
Yellow and white gold;
8.5 x 8 cm
Courtesy Jan Lohmann

A new vitality in metalwork design may be detected in Scandinavia over the past decade, with many new artists and craftsmen entering the field. The work of Jan Lohmann combines the best of traditional techniques of metalworking with a new interest in sculptural form. A radical departure from jewelry designs of mid-century, this brooch is talismanic in effect, suggesting both a stylized bird in flight and a ritualistic object. Even within this small format, the designer has achieved a monumentality of effect.



Tone Vigeland (born 1938)
Norway
Necklace, 1981
Steel silver, gold, mother of pearl; 19 cm (diameter)
Collection of Nordenfjeldske Kunstindustrimuseum, Trondheim

Vigeland has become one of the leading jewelry designers in Norway today, with a substantial body of work to her credit from the 1960s and 1970s. A master of innovative technique, Vigeland often combines precious and nonprecious materials in a manner that is distinctively personal to the artist. The featherlike segments of this necklace are fabricated from commercial blued steel nails, each hammered flat and attached to the collar. By way of contrast, gold "husks" are overlaid on the surface, and the clasp is made from a smooth section of iridescent shell.

Jewelry Design: The Art and the Profession

by Alfred Durante

This is the first of a series on jewelry rendering

The following is taken from a conversation held between Metalsmith *and Alfred Durante, design director at Cartier, concerning an unrecognized part of the jewelry industry—the designer. Mr. Durante also currently teaches jewelry design and rendering at Parsons School of Design in New York City.*

State of the Art

Jewelry designers at one time were employed just to do rendering; they never sat at a bench. Designing at the bench was a whole new concept that happened in the late 1950s and early 60s in the United States when the clean, simple, sculptural designs of Scandinavian metal were introduced. But before that a jewelry designer was one who sat down and with pencil, paint and brush created pieces. We're aware of jewelry construction and could probably make a piece, but don't usually want to; we're strictly designers.

Today jewelry rendering, a mandatory skill 20 to 30 years ago, is experiencing a renaissance. Only larger manufacturers and very successful businesses can afford to develop proptotypes as they did in the 50s or 60s. Smaller firms and freelance designers, instead of making actual pieces, are now studying jewelry rendering because they can formulate a line without actually creating the work. Its only cost is in time and effort. However, to really get an idea across you must be a serious illustrator. Most people don't know how to read designs, so the pieces must leap off the page: I'm a bracelet; I'm an earring. Look at me. I'm gold; I'm colored stones; I'm diamonds. A rendering must tell the whole story.

Consumers today have a great deal to say about what they want. The public has become more sophisticated and educated, more aware of quality. Men and women alike are more interested in wearing their possessions than living in them. At one time wealth was displayed in the home. But people, more mobile now, would rather carry their wealth on them, which means that jewelry plays a bigger role. In the trade "necktie products" are anything that you wear—jewelry, watches, clothing. And these are now the biggest sellers. Women's jewelry is on the upsurge. Women want to demonstrate their professional place in society and will pay a good price for a good product. I feel that the jewelry industry is in store for a boom. And although people are a little frightened of the economy just now, I think that new designers entering the field should not be discouraged. Jewelry, jewelry design, jewelry making—the art of jewelry—is seeing a renaissance.

Learning Jewelry Design

Fifteen to twenty years ago there was no place to learn about jewelry design, no schools, no inhouse apprenticeships. Today, schools like Parsons School of Design and The Fashion Institute of Technology are beginning to offer such courses. I believe that in the competitive marketplace you must be well-rounded, so I treat my classroom like a professional design studio. I give students an overall jewelry background, not only in rendering—preliminary design, color concept and composition—but also in metals, gemology, professional attitude and marketing. Every three to four weeks we critique class projects. The students discuss one another's work, in the way I feel they learn best, and then I give suggestions, stressing what they've done right. Then we pick certain pieces and analyze them from the standpoint of marketing. Is the piece salable? We try to price it out by the value of the metals and stones, the complexity of the design. I try to make students aware of many aspects of jewelry design. Class projects relate to the current jewelry field. Right now, because rings and earrings are very popular, I might assign a line of pavé diamond and gold earrings, specifying a $2,000 budget for the advanced class. This encourages them to survey the retail market, current prices and the current look, gleaning practical knowledge of materials and marketing. They also go through magazines, pulling a little from here and a little from there, which doesn't hurt when you're a student because you're learning what's out there, what the public wants.

This year I will be teaching both a beginner and an advanced class, and the advanced students will not only be doing jewelry but also product rendering, from crystal to holloware. One of my former students applied for a job designing products. In his portfolio he had to show crystal and simple objects like pens and keyrings. Normally, you wouldn't learn to render products in a jewelry design course, but product design is a reality of today's marketplace and a place to make money.

Looking for Jewelry Design Work

How do new designers obtain jobs, and determine what is available? How will your portfolio be received, and how will your designs be treated when you are asked to produce?

A designer was approached by an independent group to create a line of jewelry which they would market. They overwhelmed him with promises of big money, royalties and promotion. He worked up two or three imaginative designs. After they were delivered and accepted, the group turned around and bargained him down on price. Not only that, but before they had even paid him for the first designs, they came back wanting more, with further promises. It happened that the story came to me from the other end—from the people who were buying the designs from the group. The group was selling the designs as their own; moreover, they were paying the designer $150 apiece and selling them for $1,000!

Needless to say, this is something to watch out for. I tell my students, don't sell yourselves short, because if you do, you're selling me short. Designers are an important part of the industry and where it all begins. Even established designers have yet to be given what they deserve, and I'm not just talking about dollars, but also about establishing a name and a reputation. However, this can change if designers maintain standards for themselves. When making a deal with an independent firm, be sure you have a written agreement; involve a lawyer and get money up front. Better known houses will explain their policy before you are hired—that your name, for example, will not necessarily be mentioned with the design, but that there is an established rate you know will be paid. New designers entering the field should acquire a sixth sense to evaluate opportunities and make prudent decisions about the value of their work.

Mine is a funny story because I knew nothing about jewelry when I entered the field. When I was 10 years old my school started a special art class because I wouldn't do anything else—the teacher would give me a piece of chalk, and I'd draw on the blackboard all day. I loved to draw and paint. At age 13 I entered the High School of Art and Design in New York, which was then called School of Industrial Art. There I majored in advertising and fashion illustration. For me it was the most wonderful school in the world. After graduating, I found that competition for jobs in the art world was fierce, so I applied for work at Chemical Bank. However, one day I was called into the employment office. There was a job

"Jewelry, jewelry design, jewelry making—the art of jewelry—is seeing a renaissance."

open at Cartier, and six of us had been chosen to apply. At the time Claude Cartier was the owner and in charge of the design studios. First the designers looked over our portfolios and then put us through a few days of experimental testing, giving us renderings to copy and asking us for input. Finally, on the third or fourth day, they gave the other boys back their portfolios and told me that Mr. Cartier wanted to see me. I went downstairs, and he offered me the "big money," and I was hired as an apprentice.

The first job I was given at Cartier was a rendering of a 12" diameter gold serving tray. I didn't have a clue of how to do it. I was used to painting on illustration board, but here I had to use vellum. When you do a wash on vellum, if you don't know how to handle it, you have nothing but a lot of valleys and hills. I went home in tears. But my mother persuaded me to go back, and I finally succeeded. I was assigned to design stationery because I was very good at fine, detailed work. I would also do finishing work for the other six Cartier designers. As an apprentice I moved around, spending many hours in the library researching jewelry or studying heraldry for stationery. The study of the art of heraldry gave me tremendous insight into design, because a coat of arms or a crest is laid out with the same concept of composition as a piece of jewelry.

After a while I began working for the head designer, Maurice Daudier, whom I still consider to be one of the great designers, a brilliant man. I was a sponge; my eyes were open, and I watched. I was getting a good education while working.

At 17 I was offered a position with a jeweler on 52nd Street who traveled extensively. As he worked out an idea with a client I was to make sketches. When I told Cartier I was leaving, to my astonishment, and relief, they equalled the salary offered by the 52nd Street jeweler. So I stayed on to become an assistant designer and then a full-fledged designer. In 1968 I was made design director. My designs have varied from stationery, jewelry, promotion work and exhibitions to trophies and contract work. I have designed jewelry for a number of films, including *Star, The Great Gatsby* and *The Other Side of Midnight.*

In some periods at Cartier my job has been based entirely on future predictions. I designed the gold bar, which has been copied many times. Now we are doing designs reminiscent of Cartier pieces from the 30s and 40s. This I can do well because I worked with people who were here then. Daudier, for one, was head designer for the Paris and London branches and then for New York. When I came to Cartier he had already been here for almost 30 years. So I stored much of this knowledge and learned to be flexible.

Daudier also explained to me that the difference between his generation of designers and mine was that I was trained as a painter, an artist. They restricted themselves to jewelry design. Maybe until the 1940s and 50s you could specialize, but you can't anymore. If someone comes to you with a project other than a line of jewelry you must be able to handle it. Cartier doesn't only work in silver and gold, but also in pewter, enamels, stainless steel, even wood—every material you can think of . As a designer you must be aware of the properties and construction of techniques of a wide range of materials.

Presenting Your Portfolio

Advanced students need enough work for a healthy portfolio. So, during the last few weeks I spend with students who have been with me for a year, we go over their portfolios, pulling and making additions, so that when they go out into the field, they have something of substance to show. A portfolio has a definite impact.

As a new designer, before you look for work, know your capabilities. Don't overextend yourself or offer what you don't have. Don't show copies in your portfolio. Before you are hired for a job, you'll often be asked to undergo a three- or four-day trial period, during which you'll be given projects and judged on your performance. Although this may be frustrating, a good design director can tell quickly how well you will perform and what your capabilities are.

Students always ask me what they should have in their portfolios. Have everything. What Mr. A doesn't like, Mr. B will love. So a healthy portfolio should range from inexpensive to very expensive, from commercially simple to high jewelry. It should not limit its appeal to a small manufacturer who can only do little gold pendants. However, in all your work your particular style should be evident and recognizable.

The first thing students think when they confront the market is that they are not going to compromise their work. But even though they feel they have talent, they don't know where to go. What directives do you have and where are the sources of information and referral? First, you try to meet people in the industry. Present your portfolio. Ask for suggestions and reactions to the work and, when necessary, redirect it. People

"There's no right and wrong design."

will tell you it's not what they want; but persevere. One caution, in the jewelry industry a lot of people, particularly in design, will look at your work with pencil in hand. This is common practice, and it's demoralizing for new designers who are not aware that the attitude is more a reflection of that designer's insecurity than of the work itself. Even when you're given a specific project, some designers will be ready to change the design before they see it. For new designers, the situation, already difficult because of today's weak economy, can only become more so if their egos are destroyed by somebody who rejects the work for no apparent reason. A way to handle it is to let the person who judges your work know that you want them to be creative about the work, to try to understand it without being immediately negative. There's no right and wrong in design. Fight through intimidating situations in a workmanlike way. This is a job; you can't expect to step into it easily.

The Professional Designer

On any job, you must be ready to produce. When the design director wants that line done, you can have the worst headache in the world and he won't care. You meet your deadline. The more professional you become and the more important as a designer, the more people are going to pull and tug at you, and you must learn to control that emotionally. Leave your personal problems at home. I've seen too many designers lose their positions over this. You must maintain, at all times, a professional demeanor.

In any creative field, you should not limit yourself to studying just that area. Try to experience as many facets and opportunities as are available. You could attend a school like Parsons three nights a week in continuing education, taking a rendering course, a bench course and an illustration or still life course.

One of the basics of jewelry design is observation. When I was studying with Daudier he used to tell me, always look around, consider your environment. Look at the way one object sits in front of the other on your table. When you define the space between them you create a design. From every observation you should get something. You can't ever learn enough. To this day, when I have time, I still take courses. I've taken fashion illustration at Parsons and illustration courses at the Art Students League.

Studying rendering can help you become more aware. When you paint something you learn to feel it; you touch it. Your eye is able to see the density of the piece—you go beyond the surface. Sometimes when I catch myself staring at an object, I realize I'm visually dissecting it. The other night one of my students told me she was actually feeling the volume of the necklace she was painting. She did this by the way she used her brush, moving it over the line and intensifying or lightening the stroke. These sensations, this attunement to material and construction can create the feeling of three dimensions with a two-dimensional exercise.

The second part of this series will present the process of rendering through incremental drawings by Mr. Durante. He will explain further how to translate ideas and designs with pencil, paint and brush.

Donald Stuart: *Weaver and Metalsmith*

by Gail Hook

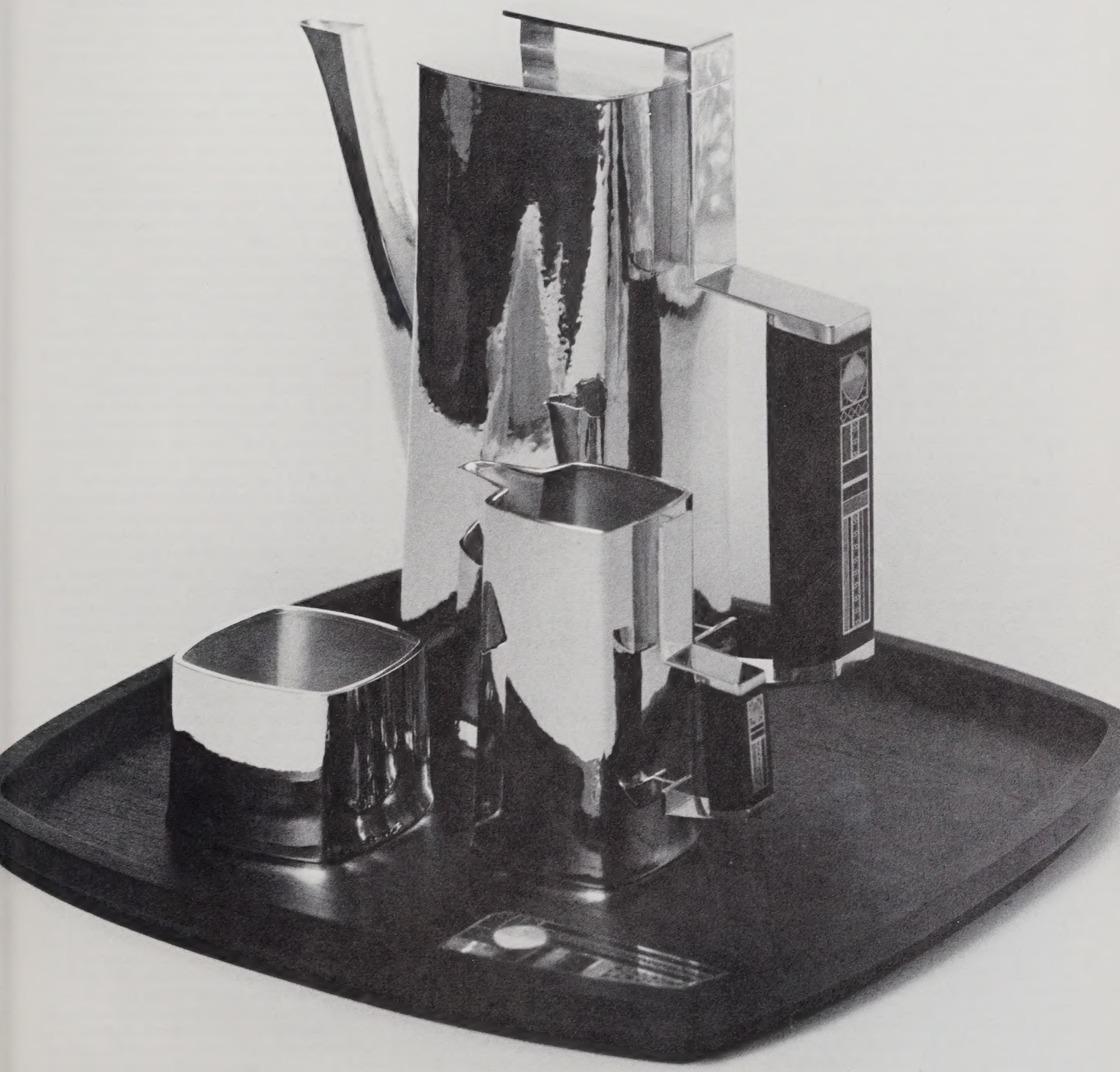
Photos: by Peter Northcott

Coffee Service, sterling silver, rosewood, inlays of minerals, exotic woods and ivory, 12 x 12 x 9", 1981

"I want to make nice things, and I want to make them well," explains Donald Stuart, award-winning metalsmith from Midhurst, Ontario.

In the fall of 1980, Stuart attained a personal career highlight when he won the grand prize in the Johnson Matthey Platinum Design Competition in the "Women's Jewelry with Gems" category for a penannular brooch set with diamonds and lapis lazuli. "Receiving this award was one of the most satisfying points of my career, because it was open to professionals from all over North America." Simple and elegant, the fibula is representative of Stuart's work in both woven tapestries and metalsmithing.

Stuart grew up in Port Credit, Ontario and attended the Ontario College of Art in Toronto, studying material arts—majoring in metals and textiles and minoring in wood. After graduation, he spent a summer as Centennial artist for the Township of Toronto, Ontario before leaving in the fall of 1967 on a traveling scholarship for graduate studies in



Scandinavia. He visited craftsmen, schools, museums and art galleries, seeking to improve his craftsmanship and expand his knowledge. Returning to Canada, he designed real estate signs until he received an offer from Karen Bulow Ltd., a Canadian handweaving company.

Hired as a consultant for a weaving project to be started in the Arctic, Stuart went to Pangnirtung on Baffin Island in the spring of 1970 to begin work with Eskimo weavers. In a huge undertaking, particularly for someone just out of school, Don was teacher, bookkeeper, packer, shipper and public relations man. The enterprise was very exciting to him, unique because no Eskimo people, to the best of his knowledge, have any tradition of weaving. Stuart spent two-and-a-half years in the Arctic, and the project grew to include 10 full-time and 15 part-time weavers. They began with craft items, such as belts, scarves and blankets, progressing to woven tapestries, which seemed to be the best way to attract buyers and build a reputation. In addition, the tapestries were more labor-intensive than material-intensive—an important consideration when all raw materials were shipped only at astronomical prices.

Although Stuart found his work fascinating, in 1972 he decided that it was time to pursue his own creative potential. With his wife, Jill, whom he had met in Pangnirtung, he returned to Ontario where he had been offered a position on the faculty of Georgian College of Applied Arts and Technology in Barrie. There he first set up a weaving program, and subsequently, a jewelry course. He taught design as well. Stuart loves to teach and stresses his own philosophy to his students: "If a piece of work is designed well and made well, with skilled use of color and craftsmanship, you don't need a gimmick. Sometimes poor craftsmanship is justified as artistic personal expression, a poor approach for a student to take if he wants to learn to do good work." Stuart sees teaching as a give-and-take situation and finds the exchange of ideas with his students stimulating. The steady income and congenial atmosphere provide a basis on which he can draw to meet the demands of his crafts.

Stuart's tapestries, woven on hand looms, are very two-dimensional. He calls them "the pure use of design, with various materials and colors chosen to answer that design and give textural variation." The designs are starkly simple, often geometric in form. The influence of his Arctic experience is clearly visible in his elemental color; the vibrant tones of sea, earth and sky dominate. The compositions are often horizontal with definite lines and distinctly separate areas of color. Natural materials, particularly wool with its enduring qualities, are favored by Stuart. "Wool as a material has stood up for thousands of years, and I would like my tapestries to last as long." Synthetics are used for their luster as an accent.

Stuart finds his tapestries evolving to accommodate his growing concentration on metalwork. Lately he has been experimenting with the soft/hard combination of metals and fibers. He designed a silver jewelry box with an intricately woven tapestry lid. A silver and copper necklace featured miniature tapestries woven of silk thread, a design that later evolved into an 8′ tapestry using metals and metallic yarns.

"I used bath chain as a fiber for its weighty, sensual quality," he chuckles. "Mind you, when Jill went to the hardware store for 50 yards of bath chain, she got such strange looks she was tempted to tell them we only had one plug and needed that much chain to reach all our drains."

Stuart's boyish delight in his work blends pleasantly with his dedication to excellence. This enthusiasm shows as he describes design ideas he hasn't yet had time or funds to execute. He visualizes a spectacular tapestry of chrome, woven chain and mirrors. The humor and energy with which he approaches life contrast with the serenity and control of his designs, and nowhere is this control more apparent than in the refined forms of his jewelry and holloware.

A distinctive feature of Stuart's metalwork is the use of the ancient technique of inlay. Many materials used are Canadian—lapis lazuli from the Arctic. whalebone, caribou antler, walrus tusk and the gorgeous butterfly wings of Labradorite. While in the Arctic, he obtained some narwhal ivory which he favors for the intricate graining caused by the twist of the tusk. Semiprecious stones, rock and exotic hardwoods are chosen for their grain patterns.

Stuart works mainly in silver with simple equipment. "I have a belief that you don't need fancy equipment to make nice things. Much as I would like to get more and better equipment for my students, we don't have the budget for it. And that's fine. I feel sorry for the students who have only the best of everything while they're at school, because they won't be able to afford it on their own!" Stuart's designs are created at a wooden bench with hand tools, and a propane torch from the hardware store, and polished with the buffing wheel of his electric drill.

As most of Stuart's work is done on commission, any changes are made in the planning sketches. He feels that a disciplined artist should be able to show a design to a customer and execute it as promised. Besides having many works in private collections, he has made large tapestries for the Cadillac-Fairview Corporation in Denver, Colorado, and the Royal Bank Plaza and Canada Life, both in Toronto, Ontario. Two major commissions were silver coffee and tea services made as presentation pieces for the Canadian Philatelic Society. As they would most likely be presented to a non-Canadian, he worked exclusively with Canadian materials for the inlays and the trays of walnut burl.

A sterling silver and rosewood placesetting was selected for "The Contemporary Crafts of the Americas" show as one of 75 pieces which toured North America under the auspices of the Smithsonian Institution from 1975 to 1977.

In May of 1981, Stuart received his Master of Fine Arts Degree from the Rochester Institute of Technology's School for American Craftsmen. The sabbatical granted by Georgian College for these studies gave him time to define and pursue his artistic goals and to add to his technical information about metals.

While in Rochester, Stuart tried deliberately to stretch his skills. "The square corners that are a theme of my thesis work were a technical hurdle for me. I knew I could make round things. And the whole purpose of the tankard was to make a heavy hinge to support a lid. I made a hinge and put a tankard around it, so my hinge won an award." Both planished and smooth surfaces are used for contrast. "I prefer the hammered finish," he explains. "It adds a quality that you can't get except by hand."

The sabbatical also opened up opportunities for him to test his skills in international competition. In the spring of 1979, he won the Mobil Chemical Corporation Award for the best of show at the juried "Rochester-Finger Lakes Craft Exhibition" for a 9″ silver fibula with inlays. And a tankard with inlays of opals, agate, ivory and exotic woods won first prize in the 1980 "Sterling Silver Design Competition" sponsored by the Sterling Silversmiths of America. He was also nominated for the 1981 Sadie Bronfman Award, Canada's most prestigious award for crafts. Juried by a select group of craftsmen, only one award is given, and the nomination alone is an indication of the growing recognition of Stuart's work.

Stuart is one of 15 professional craftsmen from Ontario whose work is the subject of an Imperial Oil slide kit produced by the OCC (Ontario Crafts Council) for its resource center. The OCC also has featured Stuart at work in the video film "Donald Stuart—Metalsmith."

The Ontario Arts Council gave him a project grant to help sponsor two major one-man shows. One in November, 1981 at the Brampton (Ontario) Art Gallery featured tapestries and metals. In February, 1982, the Craft Gallery of the Ontario Arts Council showed his metalwork. Don feels the two shows represented the range and progression of his craftsmanship.

Stuart sees these honors as "a pat on the back for a job well done—and the cash awards help balance the budget." This is no mean consideration. The coffee service he made as part of his master's thesis contains $1,500.00 worth of silver, exclusive of any artistic value. But he tries to assess his work on its own merits, and not by the vagaries of juried shows.

His work has been accepted internationally and rejected locally, and vice versa.

Stuart's thesis work shows the meticulous attention to detail, a signature of his professionalism. A brass and rosewood candelabra, designed to raise candles above eye level so diners can see across the table, has holders with holes of two sizes to accommodate both large and small candles. A silver punch ladle has a crimp in the long handle to add interest. Many people remarked on its usefulness in keeping the ladle from sliding into the punch, and it became the first of what he calls "my car-door specials."

Canada has a rich history in holloware. "The tradition of the French Canadian silversmiths in the 1600s and 1700s created glorious works. In the 20th century, however, there are very few Canadians working in this field." Stuart wants to continue and expand the holloware tradition. And because precious metals continue to appreciate in value, he predicts an expanding market for his art.

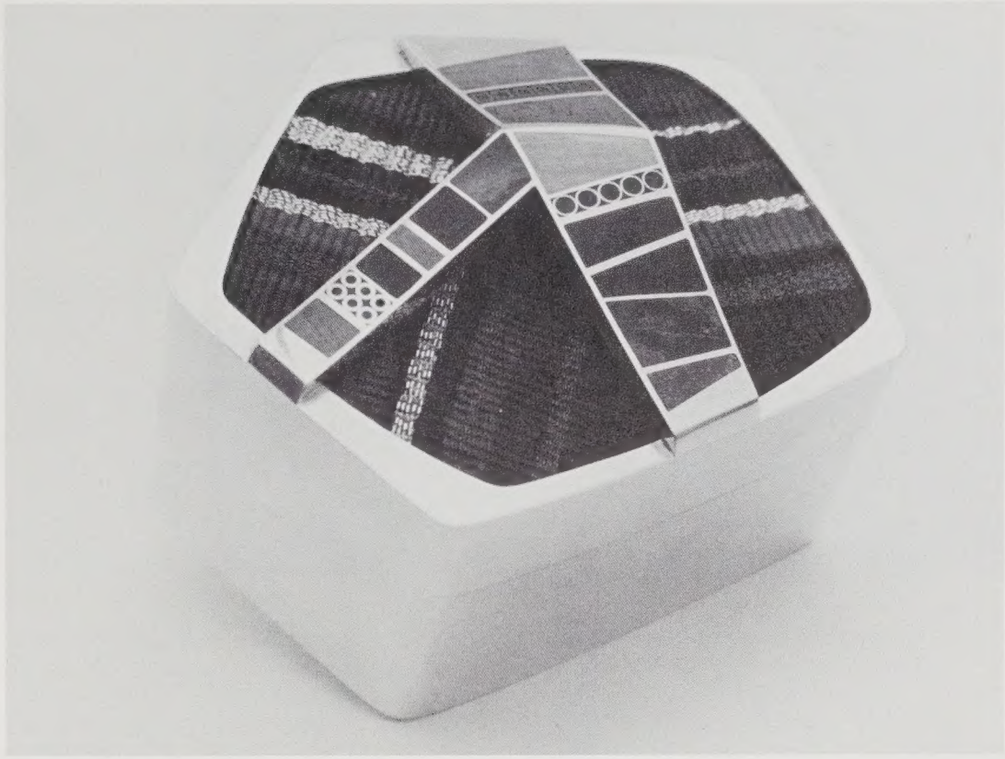
Jewelry, which entails the outlay of much less time and material, is the natural accompaniment to work in holloware. "A major piece of holloware is just too expensive for the average person to go out and buy for a Christmas or birthday present; but to buy a necklace or ring is closer to reality." This combination is in tune with Stuart's working style which tries for perfection and the frugal use of precious materials.

Donald Stuart's life is very busy—he is a full-time teacher, father of two and artist. He is president of Craft Collaborative, a group of top Ontario craftsmen seeking exhibition and sales opportunities, and he is also a former director of the Ontario Crafts Council and the Canadian Guild of Crafts (Ontario). Each job has its own demands. How does he reconcile his many roles?

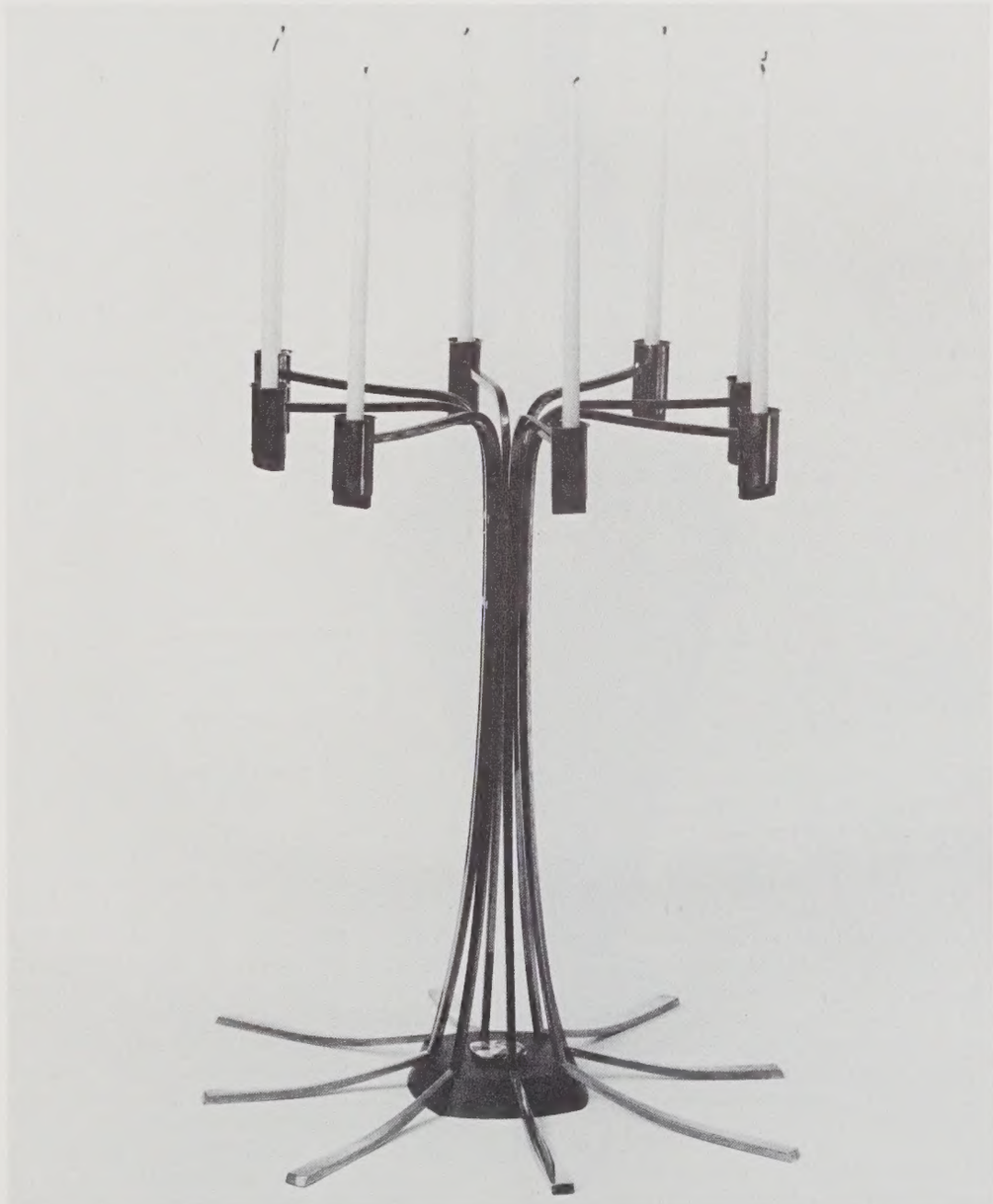
"We don't lead a highly active social life. Our life revolves around our close friends and our two young children. I have a very supportive wife. We now have a two-year plan. When the kids are in school all day, Jill may go back to nursing, and I'll be able to work at my crafts full time. We believe that we're the best people to look after our children. I would be at home to provide continuity—and I can cook, too. In the meantime, I'm well-organized and work well under pressure. And I'm trying to learn to say 'no.'"

Stuart attributes his design sense to both English and Scandinavian influences. He grins and fishes in his wallet for a dog-eared scrap of paper on which he has jotted down the essence of his feeling about his work. "Ornament and detail tend to disguise good design and good craftsmanship. Simplicity reveals."

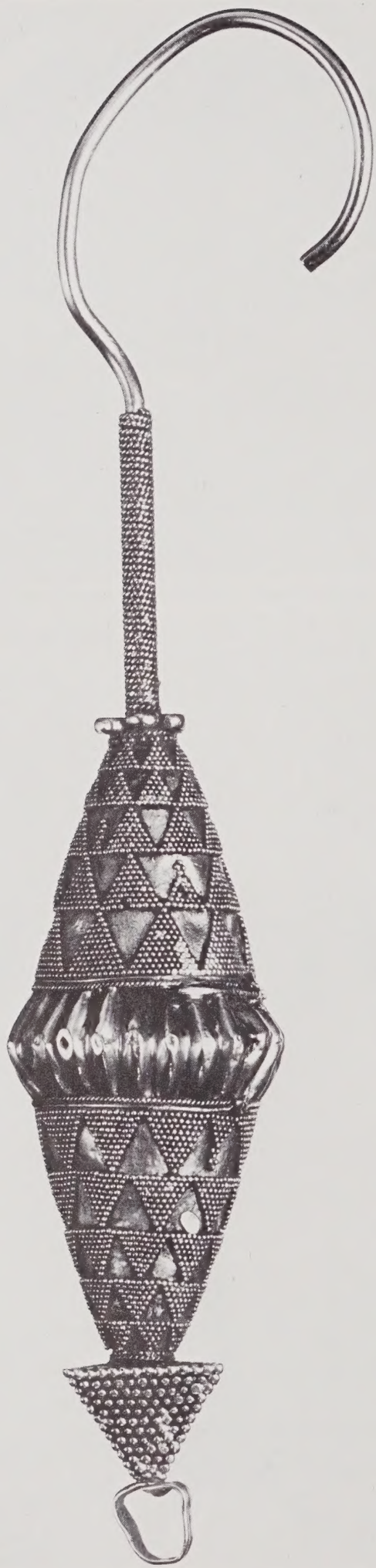
Gail Hook is a freelance writer from Barrie, Ontario. Her articles have appeared in *Canada Crafts, Canada Quilts* and *Ascent (Atomic Energy of Canada).*



Ring Box, sterling silver, inlays, insert of silk thread and metallic yarn tapestry, 3½ x 4 x 2", 1979



Candelabrum, brass, rosewood, inlays, 20" (h.), 1981



The Ancient Craft of Granulation

A Reassessment of Established Concepts

by Jochem Wolters

Granulation has been used since ancient times to produce metal grains, usually of gold and its alloys, which have served in the fabrication of jewelry. The historical development of granulation and its technical characteristics are reviewed here.

Rarely has a single technique been the subject of such protracted, contradictory and sterile argument as the ancient craft of granulation. The futility of this discussion suggests that it was based on false premises. It is worthwhile, therefore, to examine the circumstances under which it arose.

Modern interest in granulation, dating from the period of Classicism, began in France in the late 18th century, spreading to Italy (Figures 1 and 2), the Netherlands, Germany and Russia (Figure 3). This interest continued through the 19th century, aided by the publicity surrounding finds of Greek and Etruscan jewelry, and reached a peak against the background of the revival of traditional arts and crafts in England and Germany between 1913 and 1936.

When "modern" interest in this historical technique was first awakened during the period 1778 to 1850, goldsmiths and the emerging jewelry industry tried to imitate granulation work by casting and stamping processes. Moreover, when more formal investigations into the ancient technique began after 1850, these were also conducted almost exlcusively by goldsmiths. As was typical of the time, this research was characterized by an excessive interest in aesthetic aspects, by a one-sided emphasis on Greek and Etruscan work and by inadequate research into original literature sources. These attitudes, together with a tendency to overestimate the validity of practical experiments, led to acceptance of the following views concerning the process:

1. Ancient granulation was an independent technique, unrelated to other jewelry techniques
2. It was based on only one joining process
3. Knowledge of the process had been lost

Left: Fig. 8 Gold ear pendant, with field and cluster granulation in pyramidal shapes, of Caucasian origin (4th to 7th centuries A.D.). The length is 110 mm. Schmuckmuseum, Pforzheim, inventory number 1957/4. Photo: Günter Meyer, Pforzheim. **Right:** Fig. 9 Detail of a Greek gold bottle-stand with irregular field granulation of the reserved silhouette style (around 500 B.C.). The diameter of the piece is 150 mm. Photo: Musée du Louvre, Paris

4. No written record of granulation had survived
5. The details of the ancient technique could be established by experimentation alone.

These concepts were subsequently taken over by art historians and have dictated discussion to this day. It will be shown in what follows that they do not bear close scrutiny.

The Term Granulation

Present day history of art defines granulation as a technique of decoration whereby the goldsmith arranges small grains of metal, or granules, in an ornamental or figurative pattern on a metal surface. The granules are held in place by joining them to the substrate. This simple, apparently self-evident definition from the latter half of the 19th century is misleading from two points of view.

First, granulation may be regarded as an independent branch of the goldsmith's art only on the basis of the aesthetic result. From a strictly technical point of view, however, it does not differ significantly from other methods of decoration of metal surfaces, such as filigree work, which also use joining processes. It is therefore understandable that ancient authors, basing their thinking on purely technical categorization, did not describe, or even see, granulation as an independent technique.

Secondly, it is unfortunate to describe the technique by a term which up to the beginning of the 19th century had an entirely different meaning. Thus, "granulation" and "to granulate" (from the Latin *granum* = grain) originally signified "the production of grains of metal." These were of value because they could be easily dispensed. Both terms, used in the original sense only, may be found in literary sources dating back to the 15th century. The modern usage of "granulation" to describe the technique of decoration itself has made the search for references to this technique in ancient sources a difficult task.

If, however, the ancient literature is analyzed without false expectations arising from the above and purely for its technical contents, it is soon found that descriptions of all the separate operations involved in granulation are embodied in a number of writings. It is therefore possible to reconstruct the ancient technique from a study of these sources.

Technical Characteristics of Granulation

In order to gain a full appreciation of the significance of literary sources as a means of throwing light on the ancient granulation technique it is necessary to examine the technical characteristics of antique granulation work.

Materials

Gold alloys are the most common materials of ancient granulation work, and the oldest examples are those found at Ur, dating from 2560 to 2500 B.C.

Much of the early gold granulation work consists of silver-rich granules on copper-rich substrates. This is the case in finds from Alalach, in Syria (1750 to 1600 B.C.) and those from the tomb of Tutankhamen (1352 B.C.). However, in Etruscan work of the 7th century B.C. (Figures 4 and 5), analyses revealed that both the granules and the substrate are silver-rich with compositions in the ranges 65 to 67 gold/30 silver/3 to 5 copper or 60 to 65 gold/30 silver/5 to 8 copper/2 others weight per cent.

Granulation in gold on a gilded silver substrate is reported for a 7th century fibula from Marsigliana, and on copper for a Trojan decorative pin dating from between 2350 and 2100 B.C.

Granulation in silver alloys never achieved the delicacy of that in gold alloys and there are no repots of differing compositions for the granules and their substrates. The oldest known examples were found at Tell Brak, in Syria (2370 to 2200 B.C.). Silver granulation artefacts of Greek, and central and northern European origins are described in the literature and have been dated to periods extending from the 6th or 7th century B.C. to the 12th century A.D. More recently, silver granulation became common in the folk-jewelry of Germany from the 16th century onwards, of Bulgaria in the 18th century and of Mongolia in the 19th century.

Gilded silver granulation is known from Urartu, in eastern Turkey, and silver granulation on silver-coated bronze substrates was used for the decoration of weapons of the 2nd century B.C. and jewelry of the 11th century, which were found in Sweden.

Ancient granulation work in copper is very rare, one of the few examples known being a Spanish bridle decoration of the 15th century. Granulation in brass is of modern origin.

Granule Size

The grain diameter of the earliest granulations, those of the Royal Tombs of Ur (2560 to 2400 B.C.), is 2 mm, whereas that in work from Troy IIg (2350 to 2100 B.C.) ranges between 0.4 and 1.1 mm. The size of granules of the classical Greek period (510 to 330 B.C.), and of the first two phases of the Etruscan culture (700 to 475 B.C.), is of the order of 0.25 mm. The smallest granules, 0.14 mm in diameter, are to be found in Etruscan dust granulation (Figures 4 and 5) and the coarsest, measuring several millimetres in diameter, in Awarian work of the 9th century in Hungary. The fitting of granules of different sizes to the same item of jewelry was practised by several cultures, including the Etruscan.

Number of Granules

The number of granules used on a simple item can be of the order of thousands. Thus, a Greek necklace from Kameiros (7th century B.C.) bears 2,600 granules; a pendant from Enkomi, in Cyprus, (14th century B.C.) has 4,200 granules; and each of a pair of Etruscan bracelets from Tarquinia (7th century B.C.) is decorated with 20,000 granules. The largest known number of grains on a single item (137,000) is that on an Etruscan gold cup originating from Praeneste, and which has been dated to the 7th century B.C.

Types of Granulation

The granules may be arranged in a variety of ways, which goldsmiths use in different combinations depending upon the

Far left: Fig. 1 Gold pendant with point granulation and rosette-shaped massed granulation. The centre section is of glass mosaic. The height, including the link, is about 61 mm. Rome, around 1875. Schmuckmuseum, Pforzheim, inventory number KV 40. Photo: Günter Meyer, Pforzheim **Left:** Fig. 2 Gold earring with point, linear and rhombic massed granulation. This reproduction of a Greek earring kept in Leningrad was made by Giacinto Melillo in Naples around 1888. The height of the piece is 55 mm. Schmuckmuseum, Pforzheim, inventory number KV 269. Photo: Günter Meyer, Pforzheim

shape of the substrate.

Separate or point granulation, in which there is no bonding of one grain to another, is used mainly for the decoration of wires, though it is to be observed in round gallery arrangements on articles of the 7th century from Greece. It is found applied, for example, to Egyptian wire spirals dating back to 1910 B.C., to plain, corded and beaded wire eyes of the 2nd to the 11th centuries from various parts of Europe, and to wires in other types of designs from the same source and over the same period.

Linear granulation, in which the grains are arranged in lines, is very rarely applied directly to smooth surfaces. Usually the grains are set in grooves or flutes stamped or chased in the surface of the substrate. A rare exception to this is to be seen in Figure 4. The earliest examples of linear granulation originate from Troy and date back to 2350 B.C. Linear arrangements are also found in settings between wires of different types and upon double round wire. Examples of these (Figures 6 and 7) originate from various sources in the Middle East and Europe over a period extending between 2350 B.C. (Troy) and the 14th century (Russia). Free-standing linear arrangements in which the granules are attached to one another but not to a supporting surface are of four kinds: between round wires (China, 7th to 8th centuries); in annular form (Ur, 2560 B.C.); as unarticulated chains (Byzantium, 6th century) and as three- or four-row strips obtained by cutting up plates of granules, previously joined by soldering (Rome, 2nd to 3rd centuries B.C.).

Massed or field granulation, in which the grains are packed together in sheets and joined to the substrate, are found both without (Figure 8) and with surrounds which may be provided by embossed decorations (Figure 9) or by round, beaded or corded wires. Free-standing granulations in which there is no attachment of the granules to a substrate surface are known in the form of triangles from Ur, rhomboid shapes from Egypt, and as rosettes and five-pointed stars with wire borders, also from Egypt (Figure 7). Even the surfaces of wires may feature decoration by massed granulation.

Cluster or grapelike granulation, in which three-dimensional structures are built up by bonding together of granules, is known in many forms. The granules may be bonded to a backing substrate sheet, as in Danish work of 300 A.D., bonded to the outer edge of jewelry items as in Ostrogothic work of 400 A.D. (Figure 6), designed as stiff pendants as in examples from Iran and Germany, fitted to corded wire rings as in certain Russian items (1568 A.D.), or attached as tops or crowns on small cylinders as found in German work of 962 A.D.

Remnants of Joining

All surviving historical granulation work may, by visual inspection, be allocated to one or other of two groups.

Granulations with clearly recognizable traces of solder alloys originate from Egypt of the Middle Kingdom era (1910 B.C.) (Figure 7), from Iran since the end of the Parthian period (1st to 2nd centuries A.D.), from pre-historic northern and central Europe (6th century B.C. to 4th century A.D.), from Imperial Rome (2nd to 3rd centuries A.D.), from Byzantium (3rd to 11th centuries A.D.), from northern Europe of the Migration Period (4th to 7th centuries A.D.), as well as from central and southern Europe from medieval times onwards.

The granulation work of virtually all other cultures, on the other hand, shows no remnant of solder alloys whatever. This holds true particularly for Mesopotamia since the period of the earliest dynasties (2500 B.C.) (Figure 10), for Syria from 2370 B.C. onwards, for Troy IIg (2350 to 2100 B.C.), Transcaucasia from 2128 B.C., Egypt since the Middle Kingdom (1800 B.C.), Crete subsequent to the Middle Minoan Stage IB (1800 B.C.), Palestine since the middle of the Bronze Age (1625 B.C.), Iran after the 16th century B.C., Greece since early Mycenaean times (1600 B.C.), Cyprus after 1550 B.C. and for Etruscan work since the First Phase (700 B.C.). (Figures 4 and 5.)

It can be said that none of the numerous attempts at experimental reconstruction of the historical granulation technique has taken adequate account of the above important considerations.

The Technique of Granulation

After preparation of the substrate, the process of granulation comprises three obvious steps: the production of granules, adhesive fastening of these to the substrate—gravity positioning being unsuitable on most shapes other than flat—and joining the granules to the substrate.

Many accounts of all these processes are found in the historical literature and some of these are examined below, viewed against the technical features of ancient granulation work.

Production of Granules

The fact that small metallic particles tend to assume a spherical shape on melting is familiar to all those involved in metalworking. It was therefore not the formation of grains of spherical shape which posed a problem in antiquity, but rather the satisfactory and economic production of such grains in large numbers. Most historical accounts have, therefore, been written against this background.

Various methods of manufacturing granules for the convenient dispensing of metals and alloys have been described by Pliny in 79 A.D., V. Biringuccio in 1540, G. Agricola in 1556, B. Cellini in 1568, M. Fachs in 1595 and A. Libavius in 1597/1606. However, only those of the above which are based on the melting of small metal particles yield perfectly spherical grains. Of the latter processes, that described by Biringuccio, in which flattened wire cuttings are stacked alternately with layers of charcoal in a crucible and heated above the alloy melting range, would appear to yield the most uniformly sized spherical grains.

Prior to the invention of the draw-plate in the early Middle Ages (7th century A.D.) fine wire was manufactured by roll-

Left: Figure 3 Gold bracelet with linear granulation, enamel and precious stones. This piece is probably of Russian origin (mid-19th century) and was allegedly the property of Alexandra, the wife of the last Czar. The overall length is 190 mm and the width 75 mm. Schmuckmuseum, Pforzheim, inventory number 1967/20. Photo: Günter Meyer, Pforzheim

ing strips of sheet metal and it seems likely that in view of the extra cost and labour of the rolling stage, granules produced before the 7th century A.D. would have been manufactured by melting pieces of cut-up metal sheet or strip. The invention of the file in the 7th century B.C. would have made possible the production of extremely fine particles and indeed it is from this period that the Etruscan dust granulations (Figures 4 and 5) were produced. The coarse grain structure expected in granules manufactured by the melting of small metal particles may be clearly seen on a microsection of a fragment of an Etruscan fibula dating from the 7th century B.C.

Positioning of the Granules

The attachment by means of organic adhesives of small metal parts onto receptors was described by Theophilus in 1122/1123 and by Cellini in 1568, the former dealing with the fastening of beaded wire ornaments by flour paste. Since no other adhesive for this purpose is mentioned by him it must be assumed that flour paste was also used in granulation work at this time. Cellini describes the sticking of granules onto wire substrates by means of tragacanth (gum).

Apart from flour paste and tragacanth, four further adhesives for the positioning of metal parts onto substrates are described in the ancient literature. Glue made from cattle hides and termed "ox-glue" is mentioned in a 6th or 7th century Syrian adaption of Zosimos as a component of an adhesive solder, and soap, a product first developed by Gauls, is cited as part of a similar mixture in the *"Compositiones"* of the 8th century and by Theophilus. Quince paste (glue) and gum arabic, the latter already known to the Egyptians, receive mention by Biringuccio in 1540. Fish glue, already known in pre-classical times is described by Theophilus, but not termed an adhesive. Since, however, it is among the oldest glues known to man, its use in granulation work of ancient and classical times may be assumed.

The Joining Process

The attitudes which prevailed at the beginning of the historical investigation into granulation, and particularly the great attention given to Etruscan and Greek examples of the craft (which indeed display no sign of solder alloys), led to the erroneous idea that genuine granulation is produced without the use of solders. Accordingly, granulation work with recognizable remnants of solder is to this day inappropriately referred to as "pseudo-granulation."

This extrapolation of the characteristics of the products of a single epoch to the entire history of the craft ignores the fact that numerous cultures throughout the four-and-a-half thousand year history of granulation worked exclusively with metallic solders. The examples cited earlier in this article, in fact show this to have been the case for more than half of this period.

While the numerous examples of granulation showing clearly recognizable remnants of solder were obviously produced using solder alloys and fluxes known in ancient times (and there is no evidence that these were in any way different from those used for other goldwork), granulation without trace of solder must have been produced using another process. The numerous attempts to identify this process have caused much confusion. However, careful study of the literature reveals that a joining process which uses adhesive nonmetallic solders and which would produce the technical characteristics of solderless granulation bonding, was known continuously throughout two millenia.

Among modern techniques used in attempts to reproduce the ancient joining process in granulation are welding by the "melting interval" and "alloy" methods. However, the high degree of temperature control required by these methods is incompatible with the crude limitations of the charcoal fire. Furthermore, in the case of the "alloy" method, common melting point depressants such as phosphorus, silicon or bismuth were unknown in ancient times. Other reasons to conclude that neither welding technique is likely to have been used for historical granulation are that they are not mentioned in the source literature and that they are not applicable to the impure alloys used in antiquity. Moreover, the "melting interval" and "alloy" methods are not suitable for bonding granules to wire or intricately shaped substrates because of the nonuniformity of temperature distribution when receptors of these types are heated.

Sintering has also been used in attempts to reconstruct ancient granulation bonding, exploiting the increased energy density on the surface of small spherical bodies, together with the high self-diffusion of gold. However, the process is basically applicable to high carat gold alloy formulations for which there is no evidence of use in antiquity, and would appear to be incompatible with the historical gold alloys of high silver or copper content. A further factor mitigating against its use in ancient granulation would have been the difficulty of achieving even heating with fully deformed, hollow or wire substrates, granules and substrates of different compositions, or when bonding wires and granules to the same piece.

The very ancient technique of joining with nonmetallic (colloid) solders relies upon the reaction of copper compounds, applied to the areas to be joined in admixture with organic adhesives (which also act as reducing agents), to form copper(II) oxide CuO, the reaction taking place at 100°C. Carbonization of the adhesive (600°C) causes reduction of the oxide to metallic copper (850°C), which in turn forms a eutectic with silver and near-eutectic with gold alloys of high silver content. The same reaction with gold alloys of high copper content occurs at about 900°C. Bonding is thus achieved by surface alloying.

Prolonged and repeated heating leads to increased diffusion depths and ultimately to uniform distribution of the copper in the gold, leaving no surface residue. Modern analytical confirmation of joining by means of nonmetallic solders would therefore have been possible only on ancient samples for which the

Far left: Fig. 4 Etruscan gold fibula with dust granulation in silhouette style. This piece was found at Vetulonia and dates from the mid-7th century B.C. The length of the detail shown here is 50 mm. Photo: Museo Archeologico Nazionale, Florence. **Left:** Fig. 5 Etruscan gold disc earring with dust and linear granulation, from Piombino, Populonia (6th century B.C.). The piece is 45 mm in diameter. Schmuckmuseum, Pforzheim, inventory number 1969/116. Photo: Günter Meyer, Pforzheim

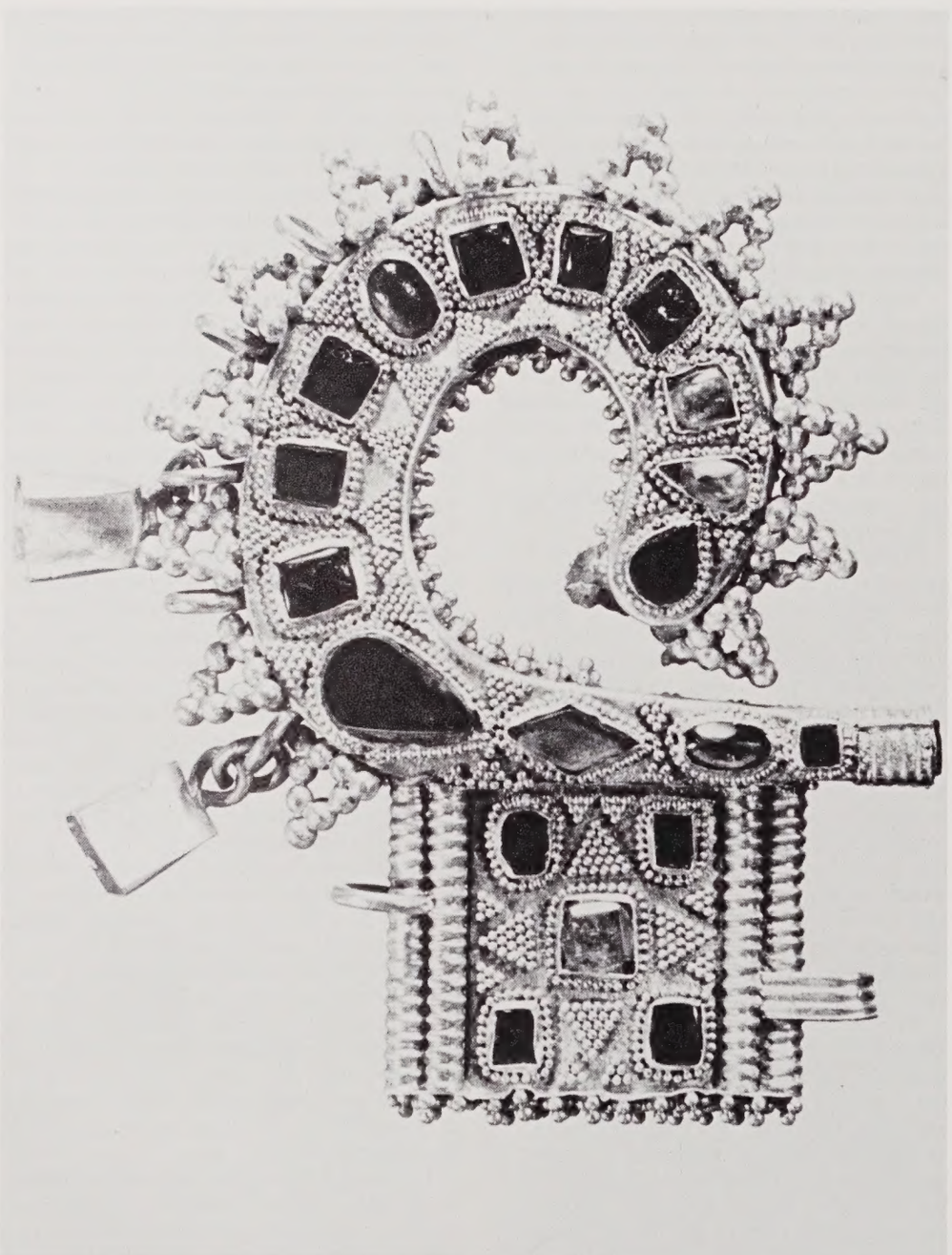


Fig. 6 Ostrogothic gold work (earring?) with linear, field and cluster granulation, precious stones and glass, from Varna, in Bulgaria (around 400 A.D.) The height is 73 mm and the width 52 mm. Römisch-Germanisches-Museum, Cologne, inventory number D 291a. Photo: Rheinisches Bildarchiv, Cologne

heating times had been short.

The use of ten copper compounds as nonmetallic solders has been traced in the literature. The oldest of these is malachite, from the Egyptian "mafek," a mineral form of the basic copper carbonate $CuCO_3.Cu(OH)_2$. Malachite, or its Greek derivative "chrysokolla" (literally "gold glue" or "gold solder"), is referred to frequently from ancient times through to the 16th century. Its first mention as a solder is by Theophrastus in 300 B.C. The term chrysokolla changed its meaning in time and Agricola in the 16th century makes a clear distinction between the "chrysokolla of the Ancients" and the "chrysokolla which is called borax." In the 19th century, Von Beudant first used the term to signify hydrated copper silicate.

Another basic copper carbonate of mineral origin, azurite $2CuCO_3.Cu(OH)_2$, has also been frequently described as a nonmetallic solder in historical literature originating with Theophrastus.

Burnt copper, black copper(II) oxide CuO contaminated with red copper(I) oxide Cu_2O, is produced by the heating of copper sheet in air, and the first reference to its use in a solder is found in the *"Compositiones."* It is mentioned in the literature as far back as the 17th century B.C.

Two other copper oxide mixtures probably used in solder compositions, though this is not specifically mentioned in the literature, are copper scale, formed from the forging of copper, and copper bloom from the quenching of molten copper. Both substances consist of red Cu_2O contaminated with black CuO. This assumption is justified by the frequent confusion made in ancient times between the oxides of copper, which are quite frequently produced as mixtures.

Verdigris, mainly copper(II) acetate pentahydrate $Cu(CH_3CO_2)_2.5H_2O$, was known to the Egyptians. Its production by the action of wine dregs on copper and its use as a substitute for the expensive chrysokolla were first described by Theophrastus. Later accounts give similar methods of production. The use of

Far left: Fig. 7 Details of Princess Chemenet's necklace with linear and massed granulation, found at Dahchour, in Egypt (around 1910 B.C.). The stars are 25 mm across. Photo: Cairo Museum. **Left:** Fig. 10 Detail of a gold necklace from Dilbat, in Mesopotamia (17th century B.C.). The pendant, 25 mm in diameter, is decorated with linear and rosette-shaped granulation. Photo: The Metropolitan Museum of Art, New York

verdigris in goldwork has been reported by several authors, including Strabo in 30 A.D. and Pliny.

The latest mention of verdigris being used in a solder was by Cellini in 1568. Some of the literature on "verdigris" appears to indicate that, in fact, patina, a basic copper carbonate of varying composition, was botained, which functioned as a solder.

The preparation of the vitriol, cupric sulphate pentahydrate $CuSO_4.5H_2O$, was first reported by Dioskurides in 77 A.D., and its use as a solder is recommended in the *"Compositiones."* Later accounts, by Mizaldus in 1574 and Libavius in 1597 make mention of it in admixture with cupric oxide.

Theophilus reported a very complicated mixture based on cupric hydroxide $Cu(OH)_2$ for use as a solder. To prepare it, a mixture of copper oxides, cupric chloride and cupric hydroxide made by heating salt-coated copper plates was added to a composition made up from potash, soap and lard (producing the reducing carbon).

The above evidence suggests that the only proven technique for producing granulation which does not show any trace of solder alloy is that which uses adhesive compositions containing copper compounds such as those discussed. These were explicitly referred to in the literature as gold solders. Apart from the use of metallic solders, this is the sole technique for joining the granules to the substrate which could have been used with the only ancient heating facility—the open charcoal fire. Furthermore, bonding with nonmetallic solders produces all the technical characteristics found in ancient granulation. Significantly, the method is applicable to all known combinations of metals and alloys used in ancient granulation, to substrates of all shapes and dimensions, and to wires and granules vastly different in size. The process may also be repeated without affecting existing bonds.

The following evidence should also be considered as support for the use of nonmetallic solders in granulation: work from different periods frequently exhibits copper-coloured spots at the granule-substrate joints, and etching and subsequent analysis show the presence of copper at the contact surface.

Furthermore the term "Santerna," used by Pliny for adhesive solder compositions is of proven Etruscan origin. Because, according to the same author, joining with adhesive nonmetallic solder compositions is especially suited for gold alloys with high silver contents, which were the preferred materials of the Etruscans for granulation, it can be assumed that both the term and the technique go back to that era.

Continuity in the History of Granulation

Never, since it was first used, has granulation been a lost art. Until far into the 19th century, the time of its alleged "rediscovery," this technique has thrived continuously in many places, for instance in Russia, Bulgaria, Mongolia, Tibet and Persia. This also holds true for Swiss and German folk-jewelry. In this context, a reappraisal appears warranted of European granulation work stemming from the time of the "rediscovery." (Figures 1, 2, 3). Because of the use of metallic solder in its manufacture this jewelry has been belittled as "pseudo-granulation." However, there is no technological difference between it and most of the granulation since the 1st century A.D., and the artistic qualities of the work are often of a very high standard.

Conclusion

It has been attempted in this study to show conclusively that debate on the ancient technique of granulation, hitherto clouded in confusion, has actually been based on five wrong assumptions, listed at the beginning of this article. From the above discussion the following conclusions may be drawn:

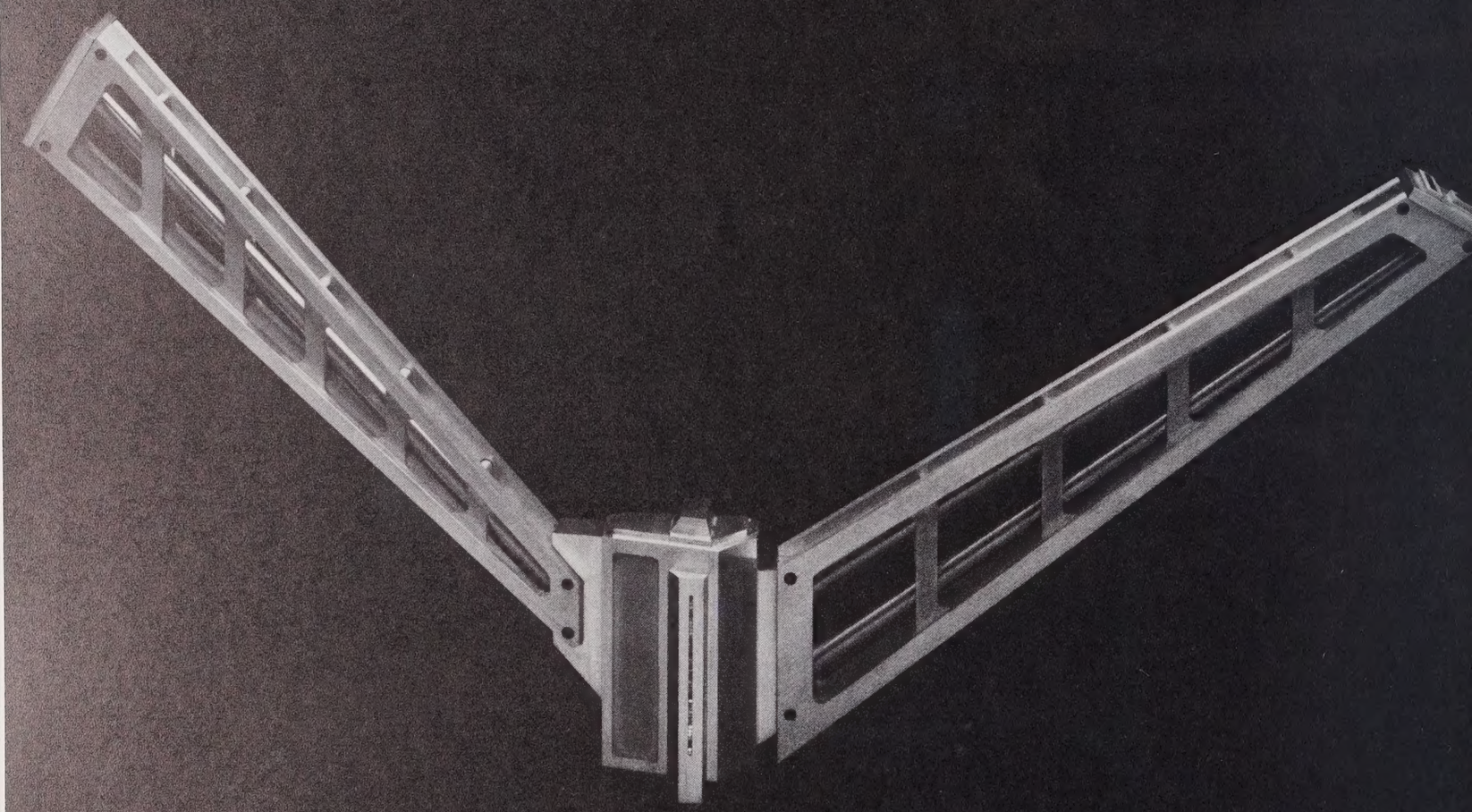
1. Granulation is a formal discipline within the art of the goldsmith; however, it is not a technique which is based on one specific joining process
2. In granulation, as in other jewelry techniques, both metallic and nonmetallic solders have been used, the latter predominantly in antiquity
3. Granulation was never a "lost" art; it survived with continuity until far into the 19th century
4. The descriptions of, or references to, joining techniques on which granulation is based can be found in numerous literary sources over a period of more than 2,000 years
5. Modern attempts to establish by experiment the origins and characteristics of the technique have contributed little to our knowledge of it. They have usually ignored the technical features of ancient work and have not been based on the exclusive use of tools, materials and processes known in antiquity.

Jochem Wolters is a scholar, chemist and author of numerous papers, lectures and books on the subject of the history and technology of precious metals and gems

Bibliographical Note

This article first appeard in *Gold Bulletin*, vol. 14, no. 3, 1981, pp. 119-129, to which was appended a two-page list of notes and references. Further notes, and an evaluation of original sources can be found in "Literary Sources on Granulation" and "Technical Conditions for the Historical Development of Precious Metal Soldering up to the Late 18th Century—Fuel, Blowpipes, Fluxes, Solders" by the author, which were contributions to an international conference entitled "Historische Techologie der Edelmetalle," held in Ludwigsburg. Conference materials are scheduled for publication by Keysersche Verlagsbuchhandlung in 1982. See also the following by Jochem Wolters: "Zur Geschichte der Löttechnik," ("On the History of Soldering"), Degussa ed., Hanau-Wolfgang, 1975; *Der Gold- und Silberschmied, Bd. 1, Werkstoffe und Materialien (The Gold- and Silversmith, Vol. 1, Materials)*, Rühle-Diebener-Verlag, Stuttgart, 1981, an English translation of this volume is in preparation by Van Nostrand Reinhold, NY; and *Granulation—Verfahren and Geschichte einer 5000 Jährigen Schmucktechnik (Granulation—Techniques and History of a 5000 Year Old Art)*, Callwey-Verlag, München, 1982 (in preparation)

The Artist's Role in a Technological World



by Peter Moss Handler and John Day Pirtle

Because they have become integral to everyday life, the possibilities and problems created by galloping technological growth are critical concerns. As artists we must address ourselves to the question of whether the products of technology and our dependence on them should be allowed to degrade or made to improve the quality of human life.

Although we refer to our era as the Age of Technology, evoking images of computers, electronic chips, television, robots and overall impersonal automation, this is not a phenomenon unique to the 20th century. On the banks of the Nile at least 6,000 years ago, the simple digging stick had already been made obsolete by the development of the scratch plow, an example of a technical means of achieving a practical purpose. Civilization itself had to await such early technological advances, the tools upon which agriculture, commerce, record keeping and the arts were ultimately grounded. Once man evolved a technology and incorporated it into his life, he became dependent on it.

The great Northeastern power blackout of November 9, 1965 lasted only a few hours, but that was long enough to raise a frightening spector: how long could a major city survive without such a given as electricity? How long would it take for social order to disintegrate into lawlessness and chaos? At the very least, our reliance on established technology is basic; our expectations for its future boundless. In the broadest sense, technology is the sum of civilization's efforts to ameliorate life and to extend the domain of human existence, with each new development altering the nature of previous existence.

Since technological advances inevitably change society, how and to what extent become crucial questions. There are no moral values inherent in technology; it is simply a means, its direction controlled by people acting as individuals, representatives of governments or officials of corporations. The use to which it is put determines its humanistic measure, whether it improves life and enlarges the range of our options or degrades the quality of life. As artists, we must examine the fundamental issues raised by technology. Because art has always been the key to understanding society's essential nature—in the case of such ancient, fragmentary cultures as the Scythians, the only criterion—our work must deal with the realities of life in our time. Technology is the undeniable backbone, however subliminal, of the late 20th century—whether it is deus or diabolus ex machina has yet to be determined and is not our ultimate concern.

The impact of technology on appearance and performance is a modern constant, from film's flickering images to monumental sculptural expression. More than at any time in the past, form follows function and is often enhanced by it. Automobile design is dictated by wind-tunnel research and the hard-edge machine esthetic, while today's ever more angular and austere buildings look like giant representations of microscopic crystalline forms. Since the Industrial Revolution, the visual arts have moved forward in tandem with their now, increasingly technologically oriented environment. Art as society's highest expression has not rejected its more traditional forms, rather, its source has shifted. A naturalistic landscape, romantic and evocative, is less germane to the 20th century than a picture of the planet Earth taken from outer space.

Such imagery, however, does not need to be literal to be relevant. Small spaceships and mechanically produced lunar vistas are model-making, not art. The springboard for artistic metaphors is not the actual things around us, but rather the inner, psychic landscape they create. Like every member of our society, artists experience modern technology as a part of a vast collective unconscious, although unlike most, artists actualize it, however conceptual or transitory the tangible evidence. The specialized role of the artist is neither to celebrate nor to criticize the fact of technology, but rather to find expression in terms of a multilevel, complex world.

Many people believe that technology per se is nonhumanistic, that it depersonalizes, displaces and alienates; we do not believe this need be the case. The artist can function to help society understand and accept the nondestructive potential of technological growth and change by drawing on the materials and artifacts of technology, divorced from their purely utilitarian aspects.

Peter Handler's *EBr-802* uses materials and machined, hard-edged images suggestive of technology, remarking positively on some of its aspects and negatively on others. *EBr-802*, a wearable, sculptural brooch, functions as a playful adult toy. It has a mercury position switch, mounted slightly off-center on the work's bridge, which makes the three unevenly spaced red light-emitting diodes flicker when set in motion, just as more traditional jewelry uses diamonds as light points. The brooch, a smoothly articulated and surfaced series of aluminum and acrylic planes, is formed by joining its two unequal piers with an indented bar. Cooly functional and geometric in appearance, straightforward in its reliance on nonprecious, machine-age metal and instrumentation, *EBr-802* stresses its humanism by its dependence on its wearer. That need for participation, a reminder of the human factor in all technology, enhances the totality of the work with a refreshing, reassuring whimsicality. At rest, the piece does not exist as a work of art; it comes to life with its wearer as the essential active element and the piece itself passive. Thus *EBr-802* acts as a metaphor for the interaction of man and machine. No matter what level of technological dependency we may reach, man is still the element needed to set machines in motion and program their direction.

Like Handler's, John Pirtle's work exists not only because of the subliminal impingement of technology on our cultural environment and its overwhelming accessibility, but also because of his intense desire to illustrate the connection between it and man. Inevitably, personal value judgements, as well as the artist's concern with social and political issues, affect the work's creation and perception. Pirtle's *CVB 1031-9L* is an electronic microprocessor-based sculpture, activated by just the slightest change in the external light density level. When the threshold light is encountered, four LEDs within the glass panels are activated in a clockwise rotation in blocks of 24 rotational counts. Thus, despite its overwhelming mechanistic properties, *CVB 1031-9L* is consistently hieratic in its insistence on the human element in its scenario; its action is entirely a function of the effects of light density levels in a viewer-controlled environment.

Clearly, as sculptors, we utilize the materials, forms and jargon of modern technology to achieve our esthetic goals while retaining artistic control over its direction. Our roles as artists are multiple. Like the anonymous Scythian goldsmiths, we are the recorders of our societies, transmitting our most intrinsic messages, in a Jungian sense, to posterity. Yet on a conscious level and to whatever degree seems appropriate, each of us is a critic of our society at this point in its evolution. This is the more challenging role: to deal discriminatingly and intelligently with technology in esthetic terms.

Even before the camera freed artists from the dictates of realistic replication and the introduction of trains to the countryside and pigments in tubes allowed the Impressionists to paint *en plein air,* industrialization had permanently altered art's millenia-old function. By early in our century, the old forms had been thoroughly questioned and largely discarded, as art theory expanded into a synesthetic confrontation with form, content, color and function. Cinema set photography in motion and created a new visual vocabulary, which was altered within a generation with the introduction of sound. In every means of visual expression, from fashion to fine art, the 20th century has seen ever-accelerating cycles. Technology, adornment and art exist in unity. Even now, with technology's esthetic of simplicity, stark minimalism, design on all levels adheres to the Bauhaus principle of "less is more." The electronic chip, as much as the clean-lined, scaled-down automobile, is a literal expression of purpose. Very often, the loss of traditional ornament suggests the dismaying loss of personality; the very subordination of the human touch and scale to function implies an arid mechanism that bodes ill for the future of civilization.

Continuing the positive attitudes of the 19th century, in which everlasting abundance and manifest destiny were cultural givens, the Italian Futurists glorified industrialization, motion and speed. Filippo Tommaso Marinetti declared in 1909 that the speeding automobile was more beautiful than the *Victory of Samothrace*[1], but by the early post-war years, the Dadaists reacted violently against the mechanism and established societal structures that had made possible the decimation of their generation. The Surrealists, passion-

Opposite: Peter Handler, *FOSO-801* sculpture, machined aluminum, stainless steel, fiber optics, 12¼x1¼x6½", 1980. Photo: Woody Packard

ately onerous and illogical, were diametrically opposed to the overt politics of their Russian contemporaries, although their use of found objects and conceptual principles comments obliquely on their environment. The Constructivists set out, by basing their ". . . aesthetic in new industrial materials, new techniques, and a fidelity in form to both,"[2] to use art as a political weapon, to galvanize the masses to political conviction and action. The recent history of artists' attempts to infuse their forms with a call to arms, to engender political change, culminated in the quintessentially humanitarian credo of the Bauhaus.

The great collective movements which, given historical perspective, seem to have tried to combine form and content, have been largely abandoned. Any concerted superimposition of theory, couched in visual metaphor, will fail, because true social change depends on a complex set of variables. Merely manipulating the physical living or working environment, as Le Corbusier did in his monumental *Unité d'Habitation* in Marseilles, will not alter human needs or expectations; the human factor is essential, but fluid.

Since it seems evident that art not only should not, but cannot change, remake or dictate to society, must our role revert to the pre-Industrial one of graphic recorder of fact and event, or one of decorator? If technology can efficiently, though sterilely, sublimate society's basic needs for food, clothing and shelter, are artists powerless today as critical estheticians and fabricators?

Peter Handler's *FOSO-801* turns the tables on encroaching technology, exploiting the visual qualities inherent in fiber optics to enliven and ornament what might otherwise seem a cool, refined, formalist sculptural statement. The piece is composed of aluminum, stainless steel and fiber optics. The body of *FOSO-801*, an irregularly surfaced, smoothly machined aluminum rectangle, down the center of which a strip of fiber optics is asymmetrically placed, is flanked by open, geometrically trussed wings. Its fiber otpics act as its primary decorative element, changing in their appearance as the ambient light falling on the piece changes. It is structurally simple, with its many small elements revealing a complexity of detail, reminiscent of an interplanetary space vehicle. *FOSO-801* humanizes technology by taking a product and tool of contemporary technology—fiber otpics—and making it visually and conceptually comprehensible and accessible. As in EBr-802, the viewer and the environment are necessary elements to a full realization of the work; when the light between the source and the receptors shifts, with the passage of time or of a human hand, the work's central panel shimmers sequentially. Once more, the effect of technology, in an explicitly technologically dependent expression, is mollified and redirected by its master.

We as artists are aware of our heritage and the failure of our predecessors to alter or remake society. Our role is not to dictate, but to choose what aspects of technology to celebrate, record or denigrate. If we consider nuclear fission reactors to embody negative human values, we would not use imagery that would show such technologies in a positive light, or we would create a piece which is overtly critical. Our fear of environmental contamination might be expressed by our inclusion of a Radiac meter into a piece like Pirtle's *72C-0212,* which points out levels of radiaiton, stray and directed, in the work's vicinity. The electronic sculpture detects local radiation in millirads by static discharge within a tube, and then displays the level on a needle gauge on the front and microprocessor-controlled light-emitting diodes on the back. The work underlines the artist's concern with detecting shifts in radiation levels and the esthetically stimulating means of alerting society to an insidious, intangible threat.

We are more than part of our society; as artists we are its voices and its prescient recorders, however consciously and to whatever degree. Even the briefest historical perspective shows the artist's position in the forefront of a people's collective self-expression; we are in an ideal place as concerned members of our civilization to help reveal technology's nondestructive face. By utilizing the materials, forms and mechanism of technology as elements in our work, subordinate to the creative, human impulse, we can transform their purely visual properties into autonymous personal statements, artists in service to inspiration.

Technology is dispassionate; human involvement determines its use for better or worse. It is incumbent upon us to refine images that, like poetry, stay in the viewer's mind, intriguing him in ways that more literal works cannot. The literal tells; the metaphorical suggests, leaving something in which the observer must participate. Our role as artists is to create images, without defining the precise nature of the images; the works will speak for themselves and elicit a different response from each viewer. Our work expresses our deep concern that technology remain mankind's servant and that its fascinating possibilities be exploited positively; our work cannot avoid expressing our position, in its frank technological vocabulary. The human element in all our work is essential to its complete expression. Mechanical parts become obsolescent and are replaceable; people are not. Technology is our tool, even our plaything, and never the reverse. We do not serve it; rather technology's constant purpose must be shown to be one of service, its goal the amelioration of the quality of human life.

Notes

1. Douglas Davis, *Art and the Future*, New York: Praeger, 1973, p. 19
2. *Ibid.*, p. 22

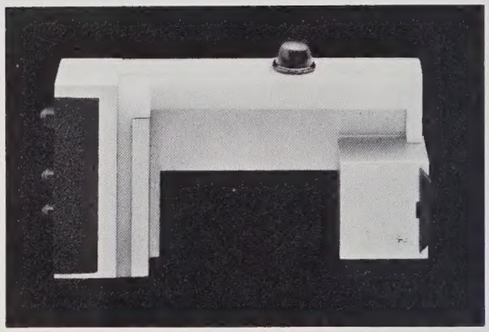
References

Burke, James, *Connections*. Boston: Little, Brown, 1978

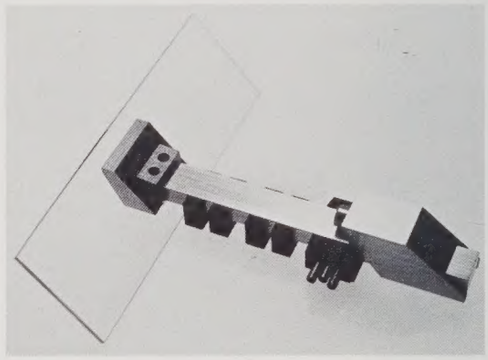
Davis, Douglas, *Art and the Future*. New York: Praeger, 1973

Hughes, Robert, *The Shock of the New*. New York: Knopf, 1981

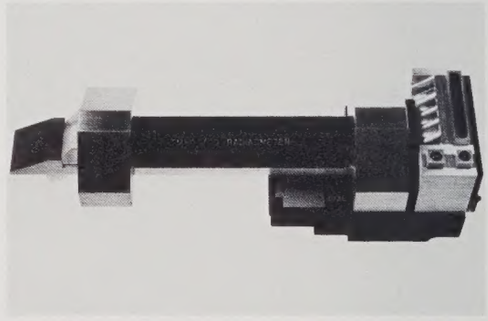
Marechal-Workman, Andree, "Visual Metaphors of a Technological World." *Artweek*, 5/9/81, pp. 1-16



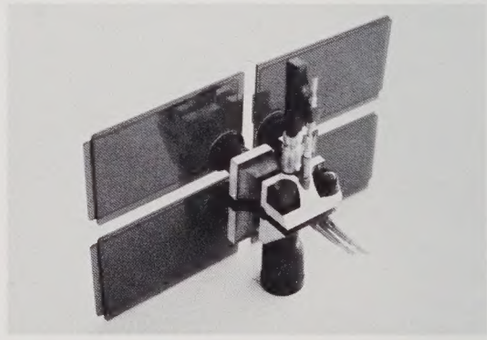
Peter Handler, *EBr-802* brooch, machined aluminum and acrylic Kydex, Velcro, electronics, 1980. Photo: Woody Packard



John Pirtle, *SBN-3600*, machined aluminum, laser, optical glass, acrylic, 3½x¾", 1980



John Pirtle, *72C-0212*, machined aluminum, radiation detector, electronics (microprocessor), 6½x2x1½"



John Pirtle, *CVB 1031-9L* sculpture, glass, electronics (microprocessor)

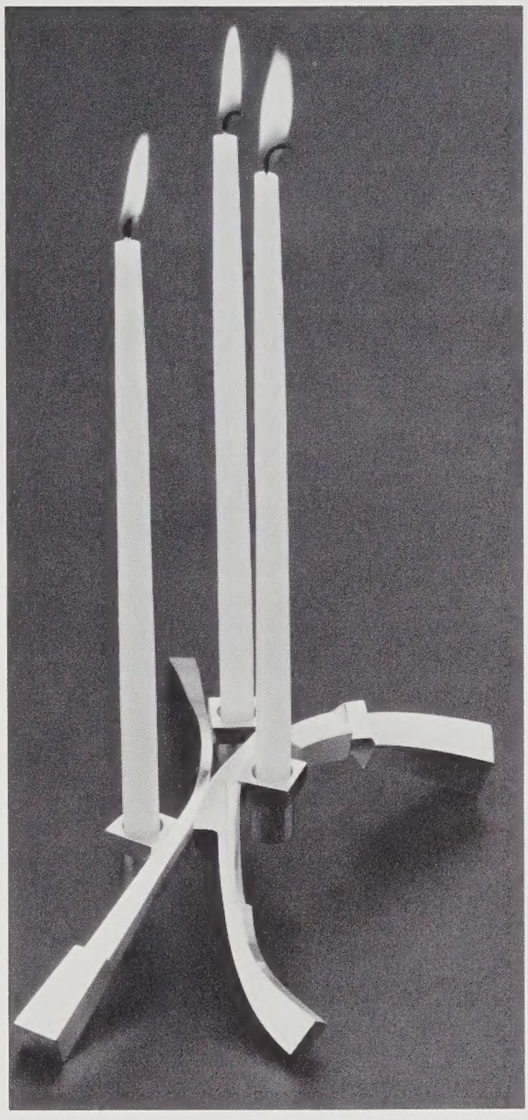
Peter M. Handler and *John D. Pirtle* were classmates in graduate school from 1978-1981 at the School for American Craftsmen of Rochester Institute of Technology. Besides working as a metalsmith, John Pirtle uses an Apple II computer as a major design tool. Peter Handler, a producing metalsmith, makes unique pieces and maintains a production line of aluminum and epoxy resin jewelry and art objects.

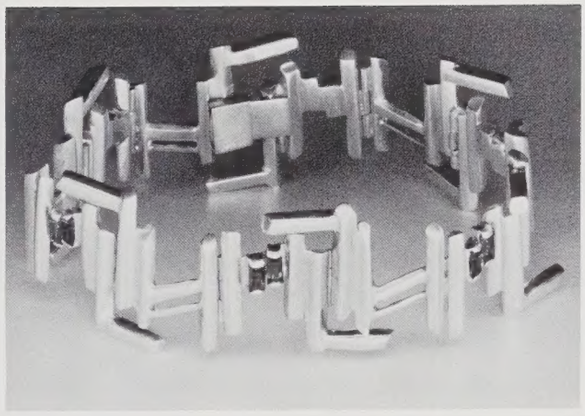
On View

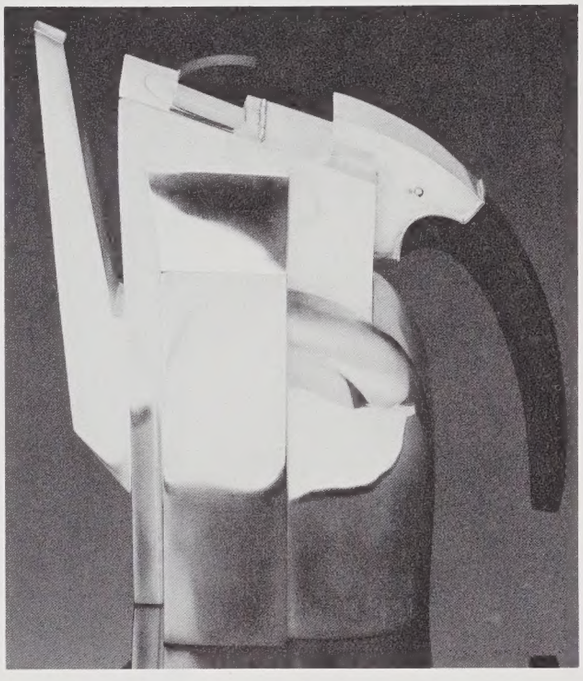
Outstanding work of students graduting from college and university degree programs in metalsmithing and jewelry design throughout North America. An ongoing series. Program descriptions were furnished by participating schools.

Georgia State University
Georgia State University offers degrees through the Art Department in Jewelry Design and Metalsmithing, both on the undergraduate and graduate levels. The purpose of the program is to train students to manufacture one-of-a-kind pieces or production work geared for the jewelry industry.

Georgia State University
Jewelry Design and Metalsmithing
University Plaza
Atlanta, GA 30303
Telephone: (404) 658-2257
Richard Mafong







David Butler, *Candlesticks,* forged ingot, sterling silver; constructed sheet **Top right:** Norma Lane, *Bracelet,* sterling silver, tourmalines; cast-hinged sections **Center right:** Thomas Muir, *Coffeepot,* sterling silver, rosewood **Above:** David Butler, *Teapot,* sterling silver plate, rosewood

Virginia Commonwealth University

The metal/jewelry program at Virginia Commonwealth University has as its primary objective the development of artistic growth in each student. Emphasis is placed on individual creativity and technical excellence, in an atmosphere conducive to intellectual inquiry. Students are encouraged to be self-motivated in seeking personal experiences and discoveries which will enable them to realize potentials and acknowledge limitations.

The program in crafts at Virginia Commonwealth University is among the few in this country to offer such a comprehensive craft program. The Bachelor of Fine Arts and Master of Fine Arts in Crafts are offered in the following areas of specialization: ceramics, fabric design/fiberwork, metalsmithing/jewelry, hot/cold glassworking, woodworking and furniture design (B.F.A.—124 credits of which a minimum of 48 credits must be in crafts; M.F.A.—48 credits of which a minimum of 24 credits in area of craft specialization.)

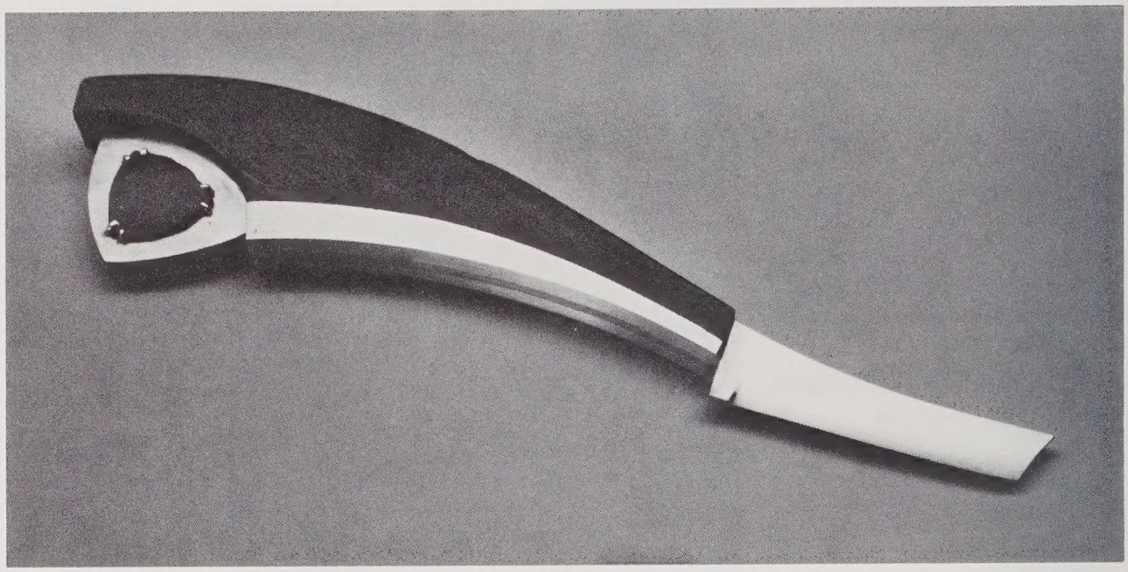
Students are encouraged to broaden their education by utilizing the wide variety of resources available to them. The five media specializations of the Crafts Department are taught by a faculty of nine professional artists, each of whom is actively involved in producing and exhibiting his own work. This affords the student a broad range of attitudes and qualifications. In addition the department is committed to the positive stimulus provided by visiting professionals representing a broad spectrum of attitudes. The visiting-artist program has hosted more than 50 craftsmen since its inception in 1972.

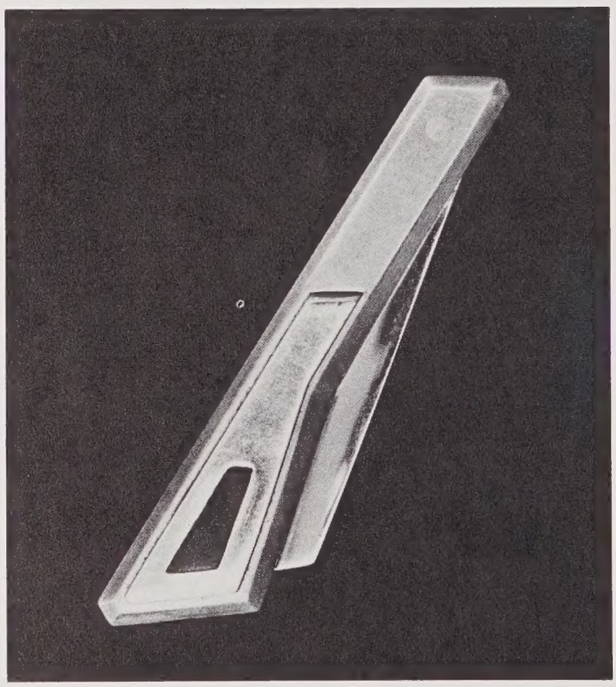
The School of the Arts at Virginia Commonwealth University is among the largest professional art schools in the United States, offering all facets of fine, applied and performing arts (with the exception of architecture) in its 12 departments. Those departments are comprised of 120 full-time faculty and approximately 1,250 full-time art majors.

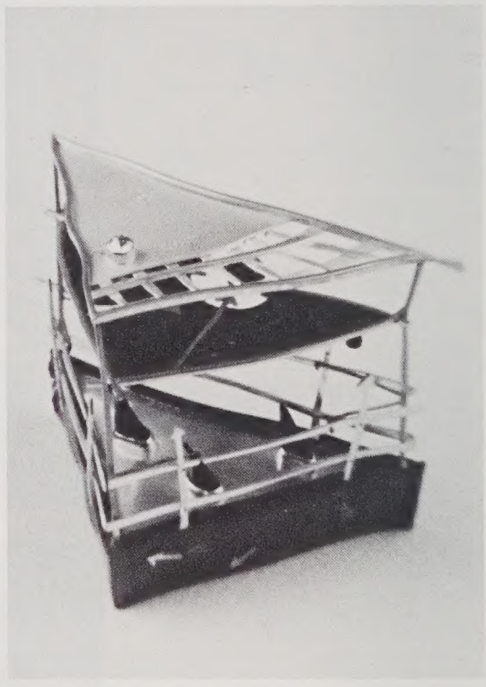
With a population of 500,000 in the Richmond metropolitan area, the city offers a wide variety of cultural resources. Among them are private galleries, museums and libraries. Of special interest to the metalsmith is the Virginia Museum of Fine Arts which houses one of the finest collections of Fabergé's imperial jewels and a fine Art Nouveau Collection. Finally, Richmond is located in close proximity to Washington, D.C., which allows easy access to the Cocoran Gallery, The Phillips Collection, as well as the Smithsonian Institution's National Gallery, Freer Gallery, Renwick Gallery and the Hirshorn Museum.

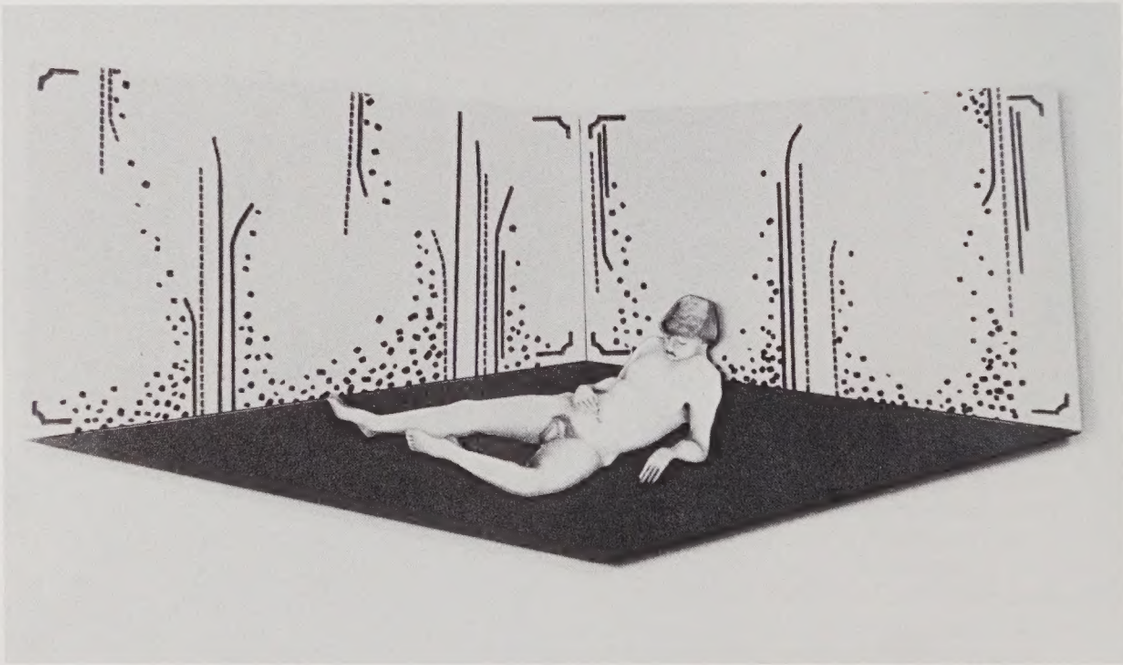
Nancy K. Thompson,
Associate Professor and
Chairperson Crafts Dept.
C. James Meyer,
Assistant Professor,
Metal and Jewelry

Crafts Department
Virginia Commonwealth University
221 Shafer St. Playhouse, Rm. 205
Richmond, VA 23284
Telephone: (804)257-1477









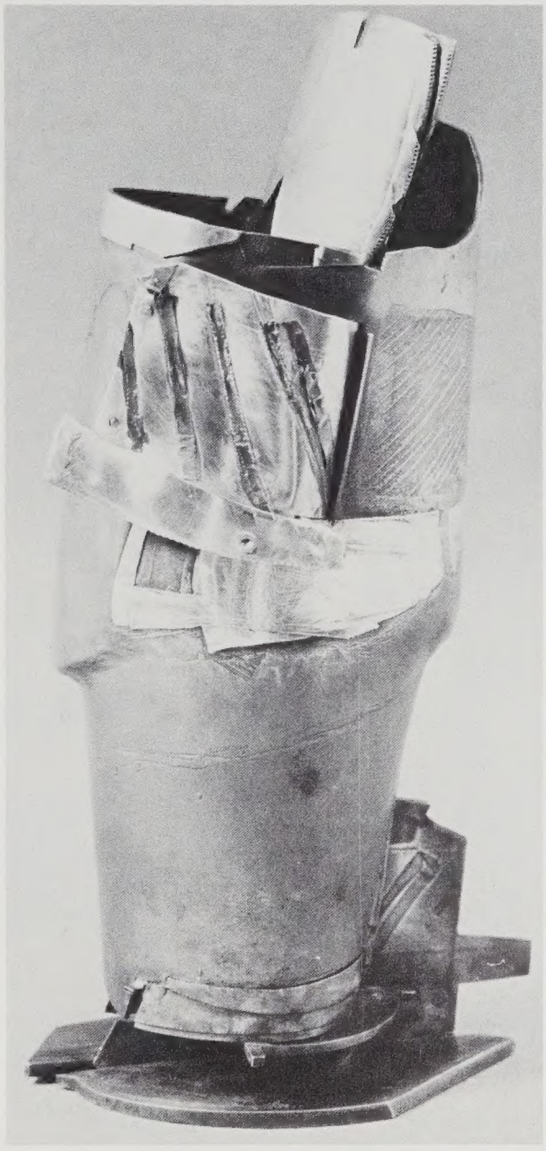
Top: Ken Coleman, *Knife,* 440-C stainless steel, ebony, bronze, watermelon tourmaline slice. Photo: George Collier **Center left:** David Rogers, *Pocket Knife,* brass, nickel silver, lapis lazuli, tool steel **Center right:** Carey Hoke, *South Seas Packet,* sterling, 14k gold, diamond, cultured black pearl, shark's teeth; can be dismantled to become two necklaces, two pins and a storage container **Above:** JoAnne Vernon, *Composition 26,* Limoges enamel figure on photoetched zinc plates

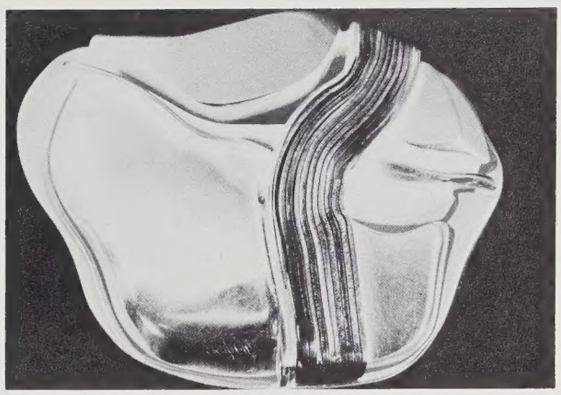
Syracuse University
The Metalsmithing program at Syracuse University is concerned with the development of the student as an artist, designer and craftsman. The program's flexibility allows the young artist to select a direction, be it jewelrymaking, silversmithing or blacksmithing or to experiment across traditional media lines to mix nonprecious and precious metals with experimentation in plastics, wood and gemstones.

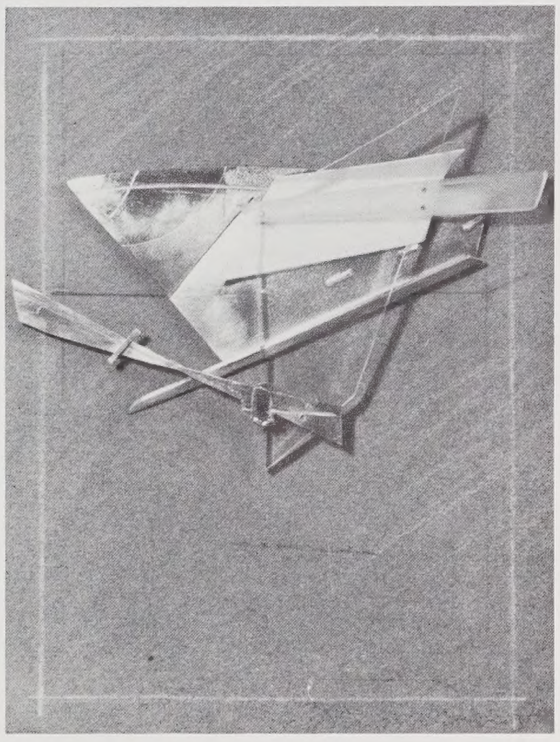
In the course of the program, objects are made that range from the highly functional to the purely expressive. In order to facilitate these explorations the program's five studios are furnished with hand and machine equipment, providing a balanced experience of fine craftsmanship and industrial processes. Students have individual work spaces and storage facilities, which they are encouraged to regard as their personal work places.

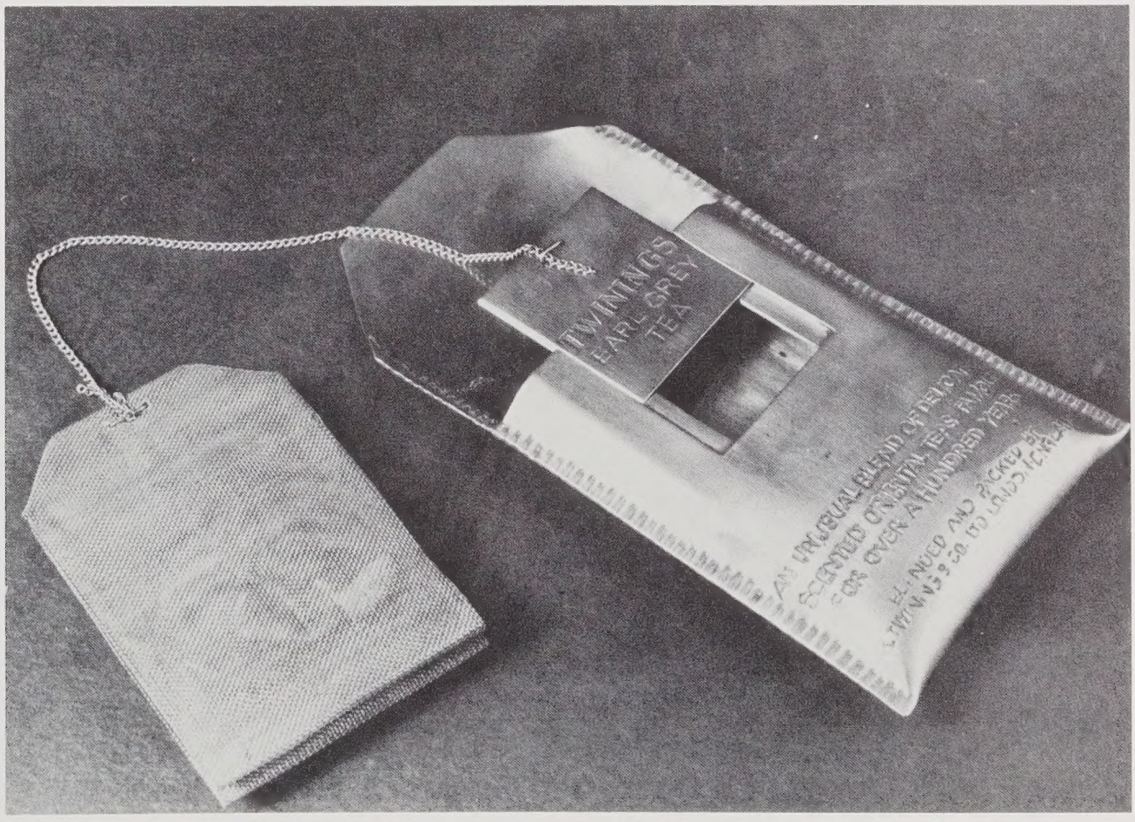
The faculty member responsible for this program is Professor Michael Jerry, who is personally involved with students from the introductory levels through the graduate program. Periodically, visiting artists have led workshops and contributed their personal perspectives on esthetics and technology. Students at Syracuse enjoy the wide benefits of an excellent professional art school and university education.

Michael Jerry
Department of Experimental Studios
College of Visual and Performing Arts
Syracuse University
Syracuse, NY 13210
Telephone: (315) 423-3700









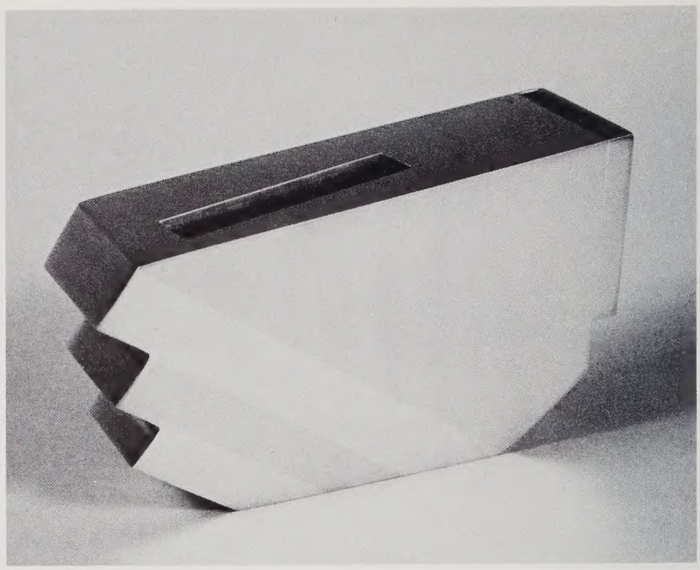
Top left: Deborah Moss Marris, *Container Form,* copper and silver; fabricated with roll-printed and electroformed surfaces **Top right:**Alison Helm, *Box,* silver; fabricated **Center right:** Deborah Moss Marris, *Wall Piece,* copper, silver, plastic **Above:** Nancy Ross, *Tea Bag,* brass; fabricated

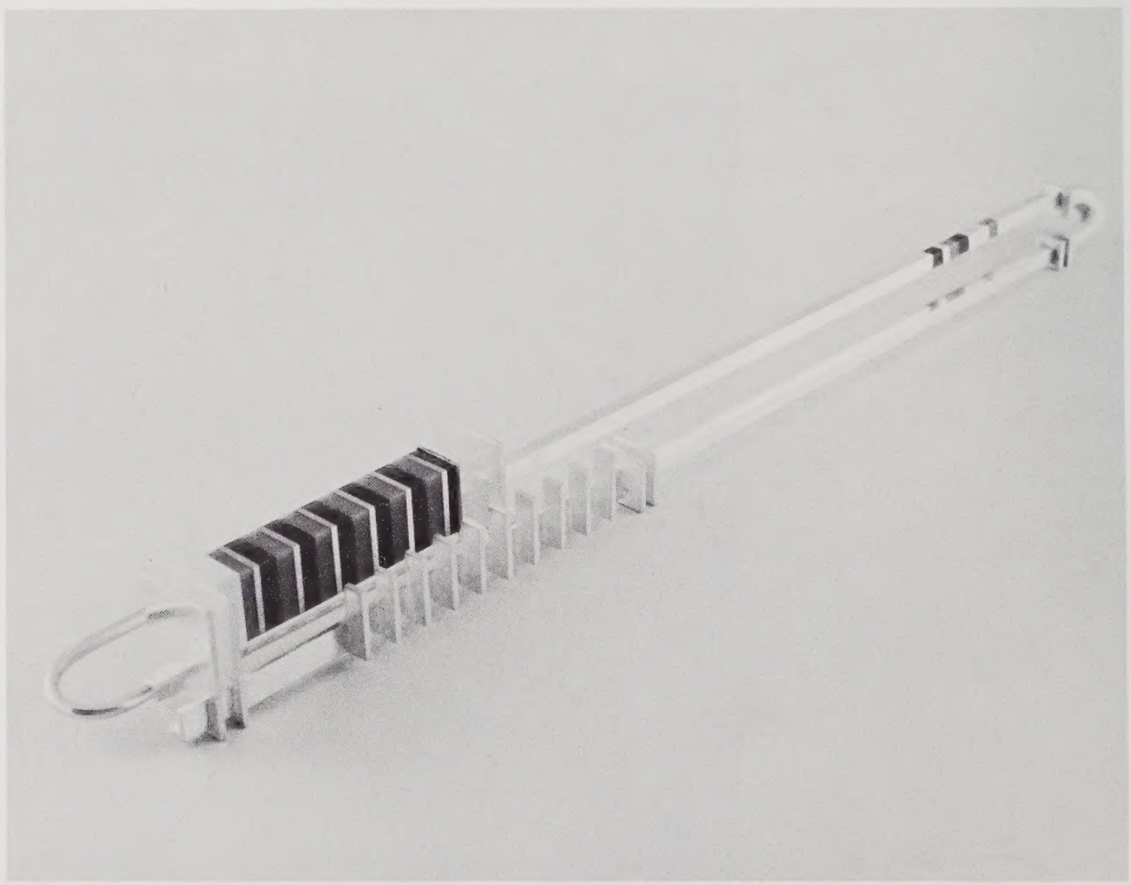
Indiana University
The Metalsmithing and Jewelry Design program at Indiana University under the direction of Leslie Leupp and Brigid O'Hanrahan is distinctive in its character, scope and philosophy. A wide range of technical and design skills is taught with an equal emphasis on metalsmithing and jewelry design. Metal is conceived as a medium in which to make an esthetic statement. Strong emphasis is placed on exploring the creative process through which an artist develops his point of view.

Students are presented with a variety of artistic and professional values through participation in an active program of visiting artists and weekly design seminars. The visiting artists program has included: Robert Ebendorf, David Keens, Randy Long, Kay Yee, Jamie Bennett, Helen Shirk and Edward de Large.

Extensive facilities are available to the students, with a separate area for graduate students. In addition to fabrication and smithing facilities, areas are provided for photoetching, titanium coloration and working with a metal lathe. The program offers a full range of undergraduate and graduate degrees including Bachelor of Fine Arts and Master of Fine Arts.

Leslie Leupp
Brigid O'Hanrahan
Metalsmithing and Jewelry Design
Fine Arts Department
Indiana University
Bloomington, IN 47401
Telephone: (812) 332-0211





Top left: Jack Silva, *Carving Set,* forged steel, steel, depletion alloy inlay **Top right:** Bill Buckner, *Cup,* nickel, brass; fabricated **Center right:** Darlys Ewoldt, *Cylindrical Container,* silver, nickel; formed, fabricated **Above:** Lin Stanionis, *Brooch,* silver, plastic; fabricated

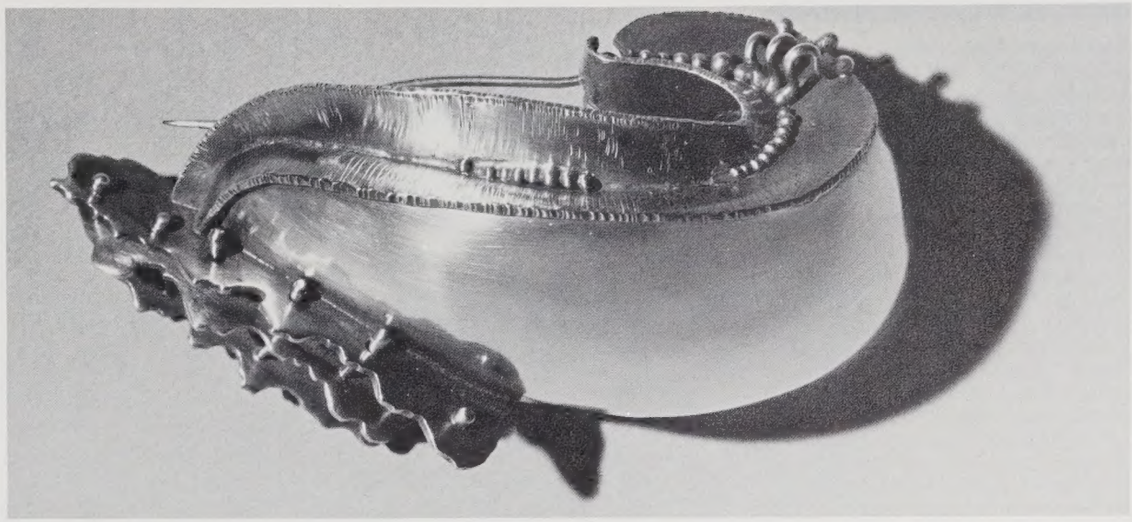
The University of Wisconsin-Milwaukee

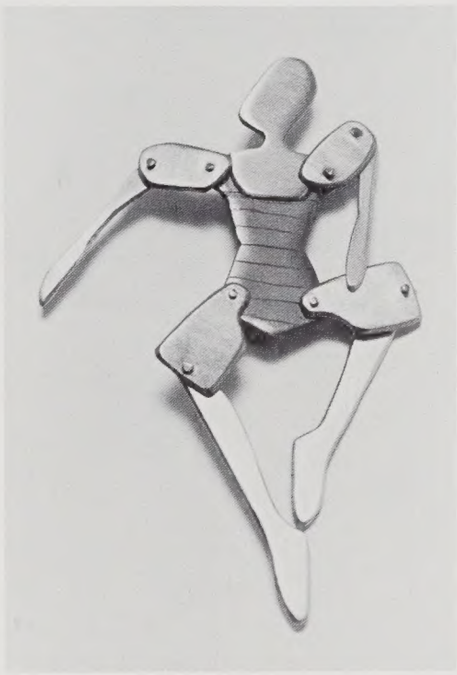
The Department of Art, School of Fine Arts at the University of Wisconsin-Milwaukee offers the B.F.A., M.A., and M.F.A. degrees with the possibility of a concentration in Metalsmithing and Jewelry. The undergraduate program is designed to give the student a firm grounding in the varied disciplines of the visual arts while providing a good background in the technical and esthetic concerns of work in fine metals. The student who elects metals as the area of concentration completes a minimum of 15 credits (5 semesters) of work in this area, 36 credits in other studio courses, 45 credits in a core curriculum, which includes exposure to other disciplines in the School of Fine Arts and 18 credits of Art Survey and Art History. In addition to those who concentrate in Metals our classes serve as an introduction to the medium for approximately one-half of the remaining students in the department.

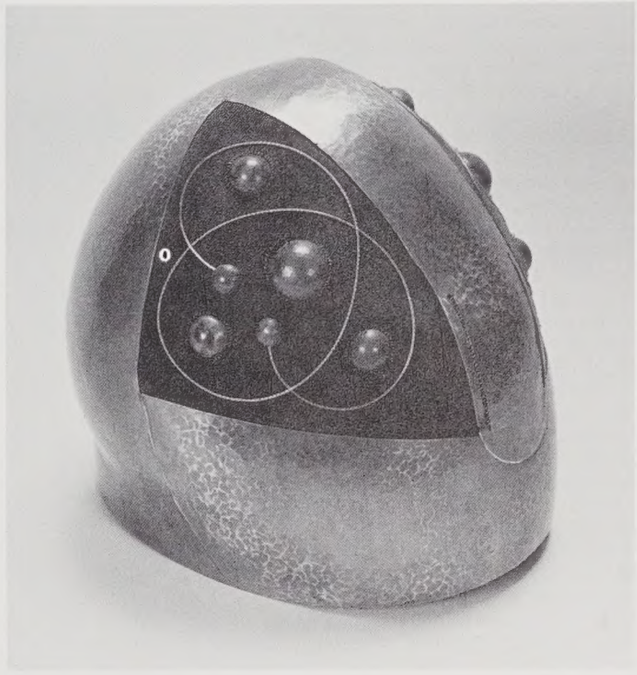
The graduate program gives students an opportunity for greater concentration in the chosen field. The development of a high level of personal expression based on a sound philosophy and supported by the achievement of technical proficiency is encouraged. Students who plan to support themselves through design and production of their work frequently opt for the 24-30 credit M.A. degree. Those who view graduate school as the best opportunity life will allow to concentrate fully on personal development generally continue on to an M.F.A. degree (48-60 credit hours).

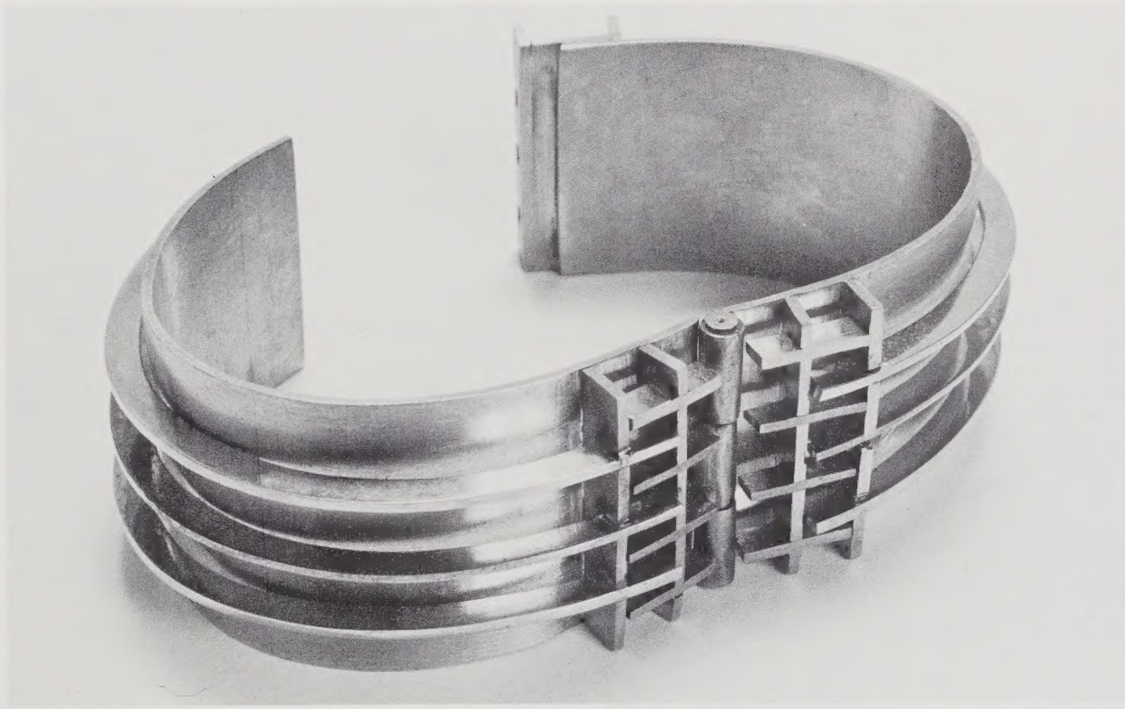
The metalsmithing studios are well equipped with facilities for smithing, enameling, casting and bench space for 20 students. A separate studio is provided for graduate students.

Mary A. Tingley
Michael Lacktman
School of Fine Arts
The University of
Wisconsin-Milwaukee
P.O. Box 413
Milwaukee, WI 53201
Telephone: (414) 963-4762









Top: Janet A. Hotson, *Raceme,* sterling silver, copper, nu gold; formed and fabricated. Photo: Alan Magayne-Roshak **Center left:** Maureen Daly, *Untitled,* nickel silver; bronze, copper with copper rivets. Photo: Dave Gess **Center right:** Jill Augustine, *Untitled,* bronze; raised and sunk; inserts suede over polyester resin; heat treated for color. Photo: Dave Gess **Above:** Patricia Yeska, *Orbital Matrix* bracelet, nickel silver, bronze; formed and cold joined. Photo: Dave Gess

Washington University

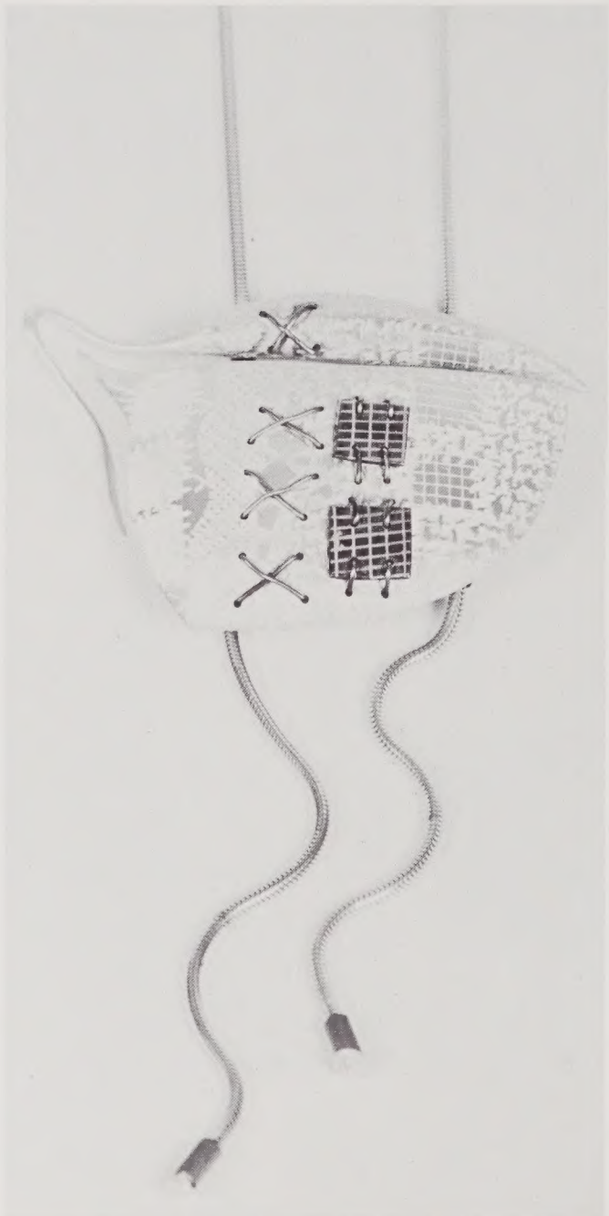
Metalsmithing at Washington University (St. Louis) is a vintage art, which under the direction of Professor Heikki Seppä, has been revolutionized with the introduction of new techniques and, indeed, a new vocabulary.

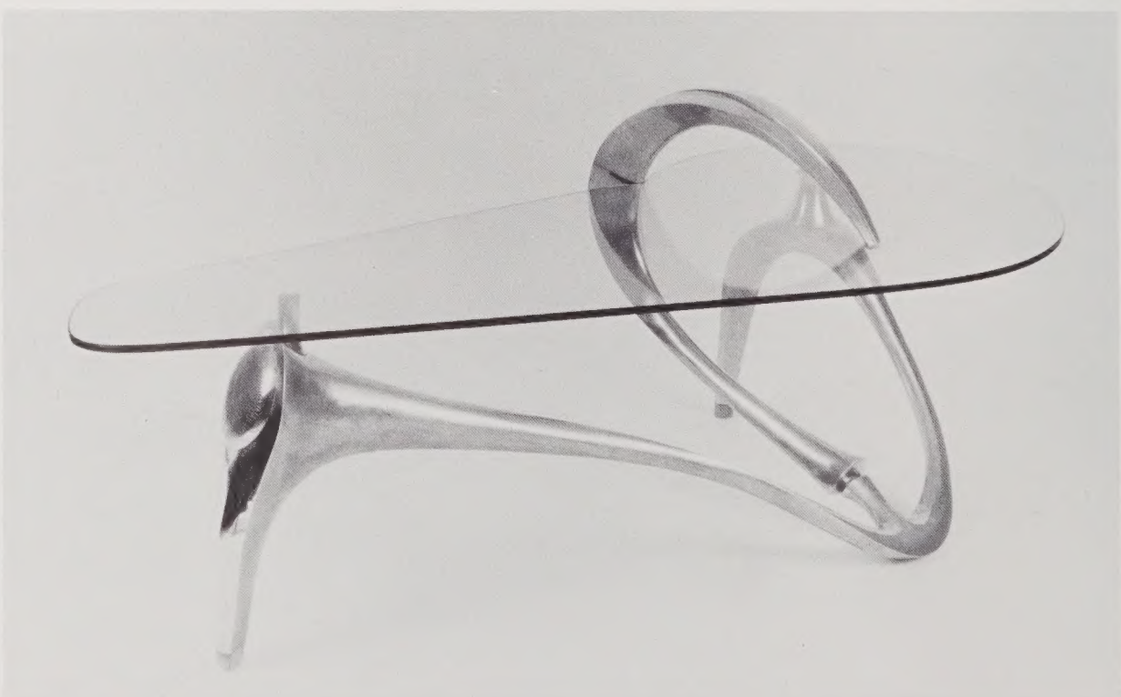
So distinctive is the silver and other metalwork emanating from Seppä's classroom that it has been called the "St. Louis Look," although he insists on its technical designation as shell structure. As defined by Seppä, "shell structures are hollow forms created from one or more 'shells' joined together. With Linnaean purpose, he and his students identified, classified and named these forms, recreating a lost metalsmithing technique and producing a teaching language. They codified some 100 generic names and suffixes for forms and processes (the latter, such as anticlastic and synclastic furrowing, have become the verbs of shell structure technique.)"

The Seppä vocabulary is as innovative as the graceful forms which are born in his Bixby Hall studio on the Washington University campus where he usually has between 12 and 15 students training to become master metalsmiths. Together, also, they have created their own tools including a "sinusoidal stake," a device which is used to great extent in forming the shells. In "Seppäese," another frequently used term is "Three-D Tessellation," which he and his students use to describe the new treatment of surfaces while retaining their three-dimensional shape.

For Seppä, metalsmithing implies "fluidity," which enables him and his students to move into bold and daring new kinds of free-flowing expression. Worrying, that his students will be overly influenced by his style, Seppä deliberately exposes them to the work of dozens of other metalsmiths via a library of some 1,600 slides which master and students painstakingly examine, dissect and argue about in a dialogue which frees them from narrow provincialism. The metalsmithing program in the University's School of Fine Arts enables them to cover its broad expanse through technical involvement with every facet of this discipline. His students interface not only with their colleagues in the physical and social sciences, but also with fellow art students majoring in sculpture, graphic communications, fashion design, painting and drawing. In such an environment, metalsmithing students at Washington University are exposed to a kaleidoscopic range of ideas which are reflected in their work which is marvelously diversified and untethered in its response to these exciting stimuli.

Heikki Seppä
School of Fine Arts
Washington University
St. Louis, MO 63130
Telephone: (314) 889-5267



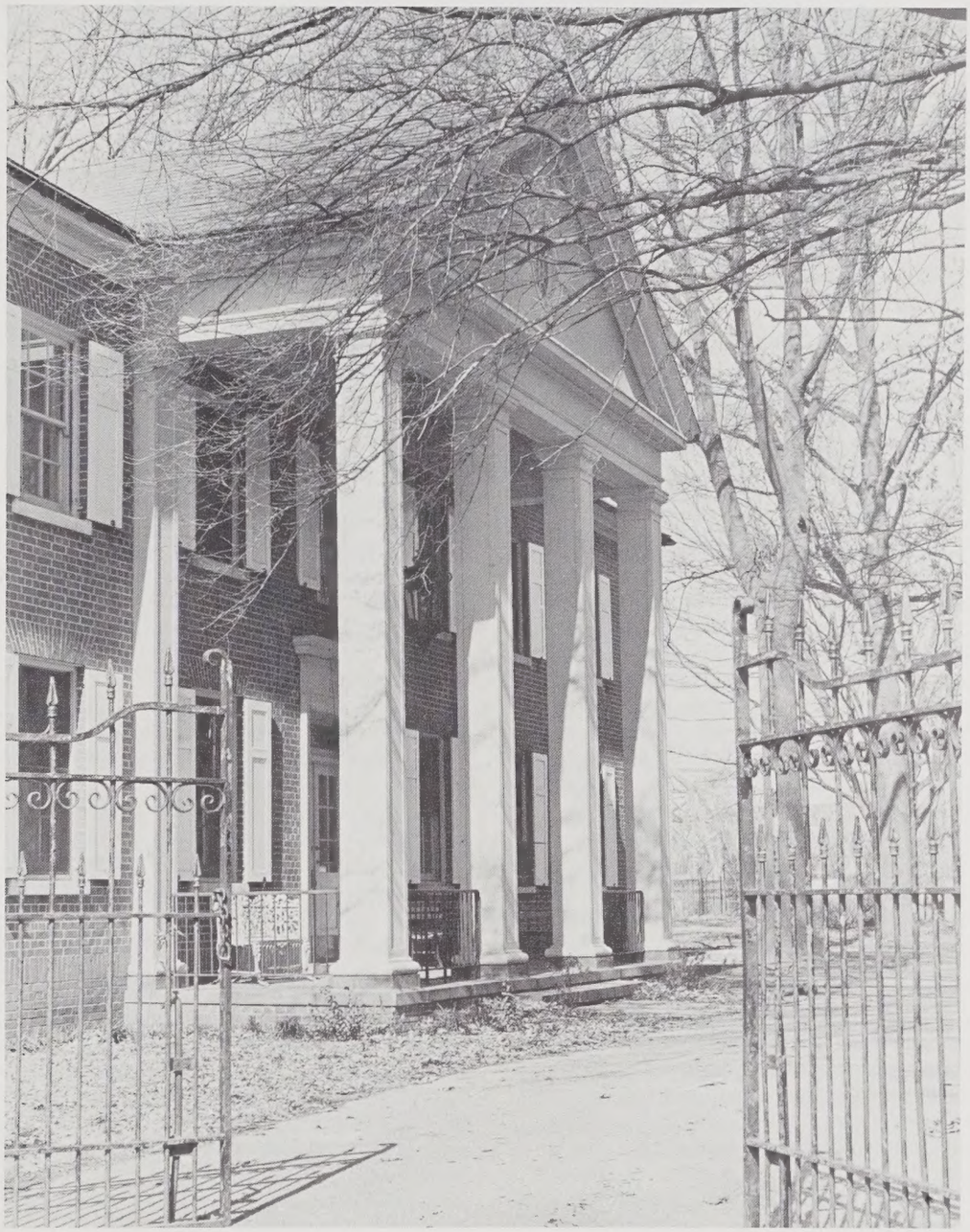


Top left: Leslie Weissman, *Untitled* pendant, sterling silver, copper; formed, fabricated, machine engraved **Top right:** Marci Davis, *Neckpiece*, nickel, silver, smoky quartz; hollow structure **Center right:** Christine Jaworski, *Sparkler*, sterling silver, bronze; shell-structured, chased **Above:** David M. Jaworski, *Coffee Table*, brass, glass; shell-structured; interior volumes filled with urethane foam for strength

Flying without a Net

Jim Wallace and the National Ornamental Metal Museum

by F. Jack Hurley



Exterior: National Ornamental Metal Museum, Memphis, TN. Photo: F. Jack Hurley

Something interesting and possibly even important is happening in Memphis, Tennessee in a group of large, friendly red brick buildings overlooking a magnificent bend of the Mississippi River: A museum devoted exclusively to ornamental metal in all its manifestations is being born. Birth is difficult under the best of conditions, and in some ways Memphis does not provide the best of conditions, so this particular labor is a slow and very painful process. After three years, no one can say for certain if the delivery is even complete, much less predict whether the infant will survive. If a group of dedicated and hard-working people have any say in the matter, the museum will live, but dedication and hard work have their limitations, and things remain touch and go.

The National Ornamental Metal Museum began in 1975 as an ill-defined dream shared by a remarkable group of "Good Old Boys" in the Memphis area. The term "Good Old Boys" has connotations not intended here: The men in this group are cut from the mold of the southern business community. Most operate relatively small metal fabricating companies specializing in anything from ornamental castings to industrial shelving to extruded steel room dividers. They are honest, decent and very hard working. Most have little or no background in art or the management of museums, but they understand

Museum interior: Gallery 3, "House Jewelry" exhibit. Photo: F. Jack Hurley

their limitations and are quick learners. They all do love good metalwork and have possessed, from the beginning, a perception that the traditions of both art and craft in metalworking are rich and deep. They have believed that these traditions are worth preserving and expanding, and that this could best be done in a special place devoted to metal in all its forms. They wanted to help create such a place. One could do worse than to have such "Good Old Boys" for friends.

The original group of men who began thinking of a museum for metal were all members of NOMMA (The National Ornamental and Miscellaneous Metals Association), a national trade group of companies with interests in architectural metalwork. In 1977, at the urging of the local Memphis chapter, NOMMA agreed to sponsor a museum—at least for its start-up period—and to take a long-term interest in its development. At about the same time a site was found—an abandoned federal hospital with large grounds and a commanding view of the Mississippi River—and real preparations began. By early 1978, the men knew they could at least start a museum, but little thought had been given to its ultimate direction. These were men accustomed to *doing things;* not abstract thinkers. This has both advantages and disadvantages. While abstract thinkers might have laid down a clearer philosophical basis for their project, they very well might have also lacked the nerve and initiative to go ahead with it.

In the summer of 1978 the group evolved into a genuine board of directors with nationwide representation from NOMMA and made a pivotal decision: They appointed James A. Wallace as the new museum's director. Wallace is a large, blue-eyed westerner whose background includes a few years as a deep mining engineer as well as an art degree in fine blacksmithing from Southern Illinois University at Carbondale. Sporting a luxuriant handle-bar mustache, a floppy, grease-stained hat and an attitude that indicates a happy inclination to ram his head through brick walls, he brought to the project tremendous, broad knowledge of fine metalwork, and most important, a sense of direction.

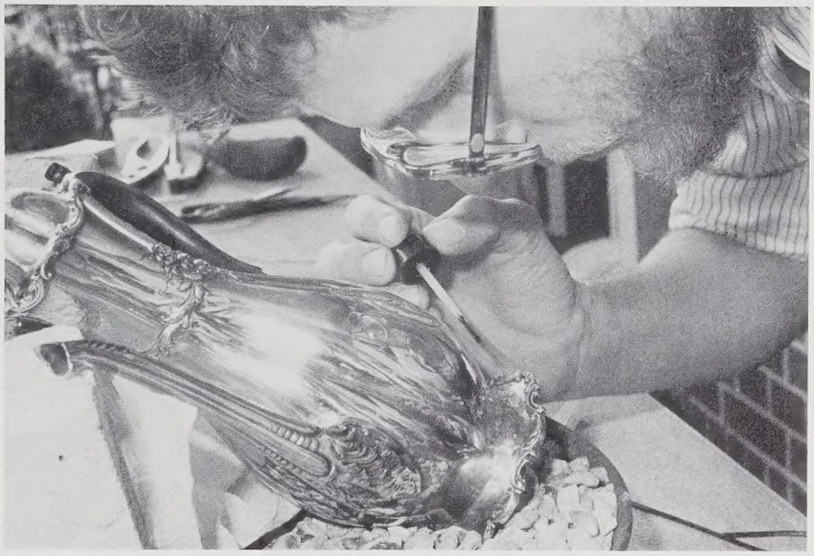
In September of 1978, Wallace, his wife Susan, their two children (since increased to three) and their faithful dog moved into quarters on the old hospital grounds and started making a museum from scratch. The building exteriors were scraped and painted, interior walls were knocked out, floors were refinished and cases were constructed. At this point, the board of directors learned that theirs was to be a far more than honorific role. Men who had run their own companies since World War II found themselves wielding hammers, paint brushes and floor sanders. Some NOMMA members drove or flew from Houston and Oklahoma City to help with the dirty and tiring work. With this sort of support the museum took physical shape rapidly.

The national Ornamental Metal Museum opened its doors to the public in February, 1979 with a show titled "House Jewelry" devoted to fine architectural metalwork. Since that first exhibit there have been one-man shows from such notables as Phillip Fike, as well as traveling exhibitions like "Young American Metals" and historic ironwork from The James C. Sorber Collection. Bernard Hosey's large gates have vied for space with Jim Cotter's bronze plates in a yeasty mixture that is nearly always stimulating. Fred Fenster's pitcher and Gary Noffke's strange little choppers have shared space with Jan Loyd's beautiful kitchen utensils in a show called "Everyday Metal." Antique woodworking tools have been shown as well as ancient and modern damascus steel. The museum has been open more or less continuously and is free to the public.

In general, the emphasis has been on fine or historical metalwork, a matter that has been the source of some restlessness on the board and within NOMMA. "When are we going to show production line ornamental storm doors?" was the question at one meeting. It was a fair question but one that betrayed a certain lack of understanding about what a museum is and why people come out to look at things. Wallace has taken an active role in committing the museum to excellence and, in very large measure, the board has followed in good spirit. The board and NOMMA have also (in equally good spirit) entered into a broadening of the museum's base of support and also of its board of directors.

Partly this was due to a shortness of money and partly it has been a matter of program emphasis. NOMMA is not a remarkably wealthy organization, though some of its members are well off. Neither NOMMA or the local group which originally developed the idea is in a position to give full financial support to the museum. Considering the museum's commitment to fine contemporary art/craft exhibits and major historical shows, it would probably not even be in NOMMA's interest to completely support the museum because there really is not going to be an exhibit of ornamental storm doors anytime in the foreseeable future. Yet it is neither a matter of the practical business people leaving the board, nor of NOMMA losing interest. It is not even a matter of the museum losing interest in industrial iron. Two shows have had an industrial orientation, and the museum is in the process of developing a major library on metal technology which will serve as a central resource for both industrial and art oriented users. What *has* happened is that for the last two years there has been a distinct movement to bring some new people onto the board and increasing recognition of the fact that, if the museum is to grow and prosper, the Memphis community must take an active role in its support. Other support is also being sought from ABANA (The Artist-Blacksmith's Associaton of North America) and other art-metal oriented groups since the museum clearly serves their interests too.

Just as he has had to lead and nudge his board of directors, Wallace has had to lead and nudge the Memphis community toward acceptance of this strange new museum in their midst. Memphis is not a remarkably art oriented community. Although a fairly sizable upper middle class group supports



Repair Day, November, 1981. Dan Neff, student at the Memphis Academy of Arts, fluxes the base of a silver coffee pot. Photo: F. Jack Hurley

the local mainline art museum and brings the Metropolitan Opera to town several times a year, the town is very unsure of itself in the areas of uncannonized art and craft: A number of people who know what is showing in the New York SoHo galleries this month remain nervous about exercising independent judgment on a silver and damascus steel brooch shown in a new museum in their home town. For regional people, art is often a very authoritarian matter, and it takes time to establish in their minds that The National Ornamental Metal Museum in Memphis, Tennessee is a voice of authority in its field. Nevertheless, it is happening. Wallace's recent appointment to a seat on the board of the American Craft Council demonstrates his ability to make informed judgments in fine metalwork on a nationwide basis.

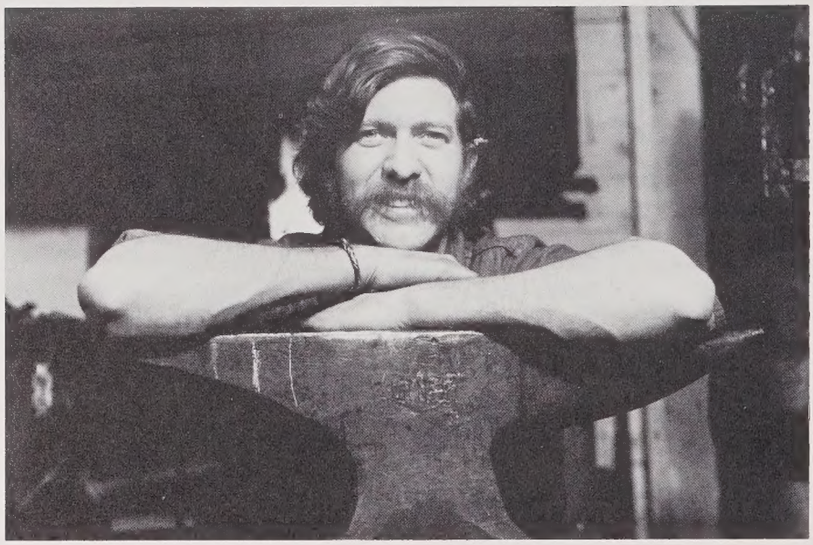
To encourage the Memphis community to come down to the river and discover its newest museum, Wallace hatched a wonderfully original idea—"Repair Day." Everybody has all sorts of metal objects lying around needing some sort of repair, he reasoned. Furthermore, it is almost impossible to get anything fixed. Why not set aside a day or two in the fall and just fix things? The first "Repair Day" was held in the fall of 1979 with the help of metalsmithing students from the Memphis Academy of Arts under the direction of their professor, Richard Prillaman. They removed dents from silver creamers, resoldered handles, retinned copper pots and had a fine learning experience. Professional welders handled lawn furniture and broken tools, while a couple of museum friends specialized in sharpening knives. The event was a success and has expanded every year since. In 1981, Phillip Fike flew down from Detroit to participate and spent two happy days creating "repairs" that often completely altered the character of the piece repaired—from a mass-produced item to art. Memphis seemed to love it although they had no idea what was going on or who Phillip Fike is. Students were attracted from Wayne State, from Southern Illinois University, Carbondale and from the Joe L. Evins Center for Appalachian Crafts at Cookeville, Tennessee in addition to the usual large contingent from the Memphis Academy of Arts. "Repair Day" has become a real event. It does earn money for the museum, though not tremendous masses of it because expenses are high and the repairs are kept attractively cheap. Most importantly, it has become a learning experience, a highly informal seminar in which students can get experience with an incredible variety of problems in metals ranging from silver to stainless steel. For natives, the event is a bonanza and has brought many to the museum who might never have found it otherwise.

All this is on the positive side of the ledger. There are also some negatives. In the summer of 1981 Wallace contracted a lung disease that looked frighteningly like cancer. It turned out to be one of the tough new strains of pneumonia, but he was down for weeks and two things became obvious. First, it was clear that he was trying to do too much on his own and without adequate help. Without the director's daily personal attention the museum's programs went into suspension. To be sure, faithful volunteers helped wherever they could: For six weeks, Jim Cooper, an advanced metalsmithing student at the Memphis Academy of Arts and a live-in, unpaid assistant at the museum, held things together, keeping the doors open and the lights on. Board chairman George Keeler and his wife, Louise, devoted great chunks of time to caring for the building and grounds, making sure that one or more of the museum's friends were on hand to answer visitors' questions. But voluntary help and dedication can go only so far. In many ways the museum's operations sagged badly. Letters that needed to be written were not; decisions that needed to made were not.

The second problem involved, predictably, money. It became clear during Wallace's illness that the financial support for the museum was still far from adequate. Among other things, there was no health insurance. There was difficulty in getting the director of the National Ornamental Metal Museum into a hospital and even more difficulty in getting him out. The other money problem, however, was of longer term significance. Back in 1980 it had become clear that the board could not pay the director's salary every month. Somewhere along the line an agreement was tacitly reached without anyone actually articulating the bargain: Wallace would keep the museum open only five hours per day. He would receive living accommodations and all utilities plus whatever part of his promised salary was available. During his time off he could earn additional income at his own forge. Since Wallace is an artist/blacksmith of national rank, his earning power is considerable. It was not a bad arrangement—until the illness struck and exposed the inherent weakness. The whole project was flying without a net, based fundamentally on Wallace's willingness to donate much of his own salary to the museum, month after month.

Ironically, Wallace's illness in the summer of 1981 may have been a major positive influence. It forced the board and the museum's friends to become more professional both in their fundraising and in their long-term planning for the museum's goals. Certainly, in the area of fundraising, the record has improved. In fiscal 1980-81 the museum operated on less than $20,000. In 1981-82, over $32,000 were available in addition to a major special purpose grant. In the area of staffing, things seemed to be improving also. Jim Cooper has continued to be a mainstay aid, and in the summer of 1982 a second part-time staff person was added to the payroll. Judy Coomber, an experienced graphic artist will help with catalog development, show installation and fundraising. In a small operation like the metal museum, one or two competent staff members can relieve the director of a considerable burden. Another major burden was relieved when Bill Gasparini, one of the strongest and most suportive board members, agreed to underwrite health insurance for Wallace.

During hard times for the arts all over the country, the metal museum manages to survive and, in some respects, thrive. In the fall of 1981, the museum received one of the top awards



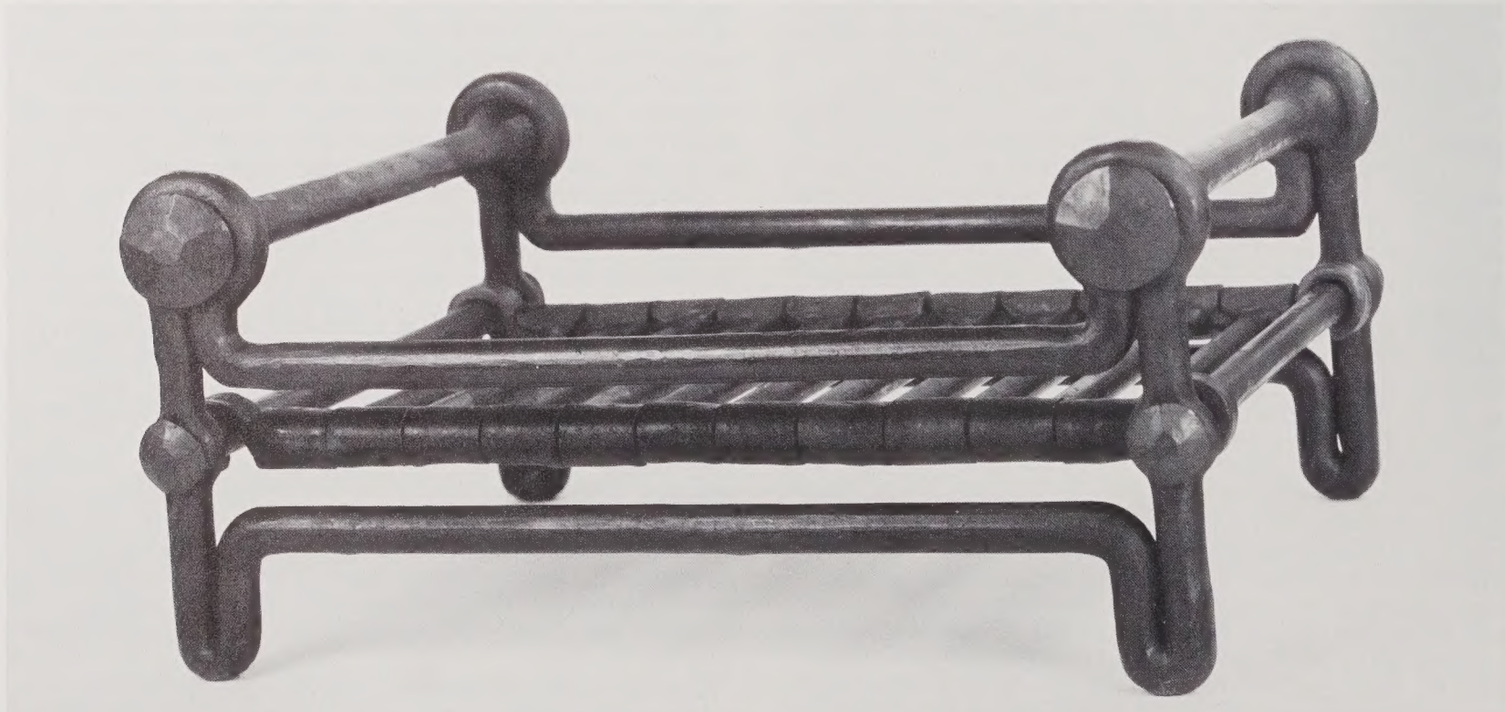
Jim Wallace, Director. Photo: F. Jack Hurley

that the Memphis community has to offer. A major local business, the First Tennessee Bank, gives a small group of grants each year to support the arts. These grants, called "First Bravo Awards," ranging up to $25,000, are highly coveted objects of keen competition. The selection committee is respected and represents a solid cross section of community interests. In other words, the money is good, and the recipient of a grant can feel with some confidence that he is gaining the attention and approval of that part of the community that cares about art. The National Ornamental Metal Museum won a top $25,000 "First Bravo Award" to underwrite the largest and most important exhibition it has ever mounted, titled "Towards A New Iron Age." That project is well under way now, and the show will open in September of 1982.

The exhibition has been an international cooperative effort in which Wallace has worked closely with Claude Blair, keeper of metals at the Victoria and Albert Museum in London. It is a truly international show featuring the very best in hand-forged ironwork from Europe (both Eastern and Western), the United States, Canada and Japan. After opening in London, it will come directly to Memphis, then travel to the Flint Institute of Art in Flint, Michigan, the University Museum of Southern Illinois University, at Carbondale, the Mint Museum in Charlotte, North Carolina and finally to the American Craft Museum in New York City. The exhibit and its catalog will inevitably have a major impact on the direction of metalwork, particularly iron, for years to come. That a three-year-old, rather shaky museum in Memphis, Tennessee could be involved in such a major project should be a source of hope for people everywhere who consider similarly immense undertakings. The word from Memphis is, try it! You may even learn something in the process.

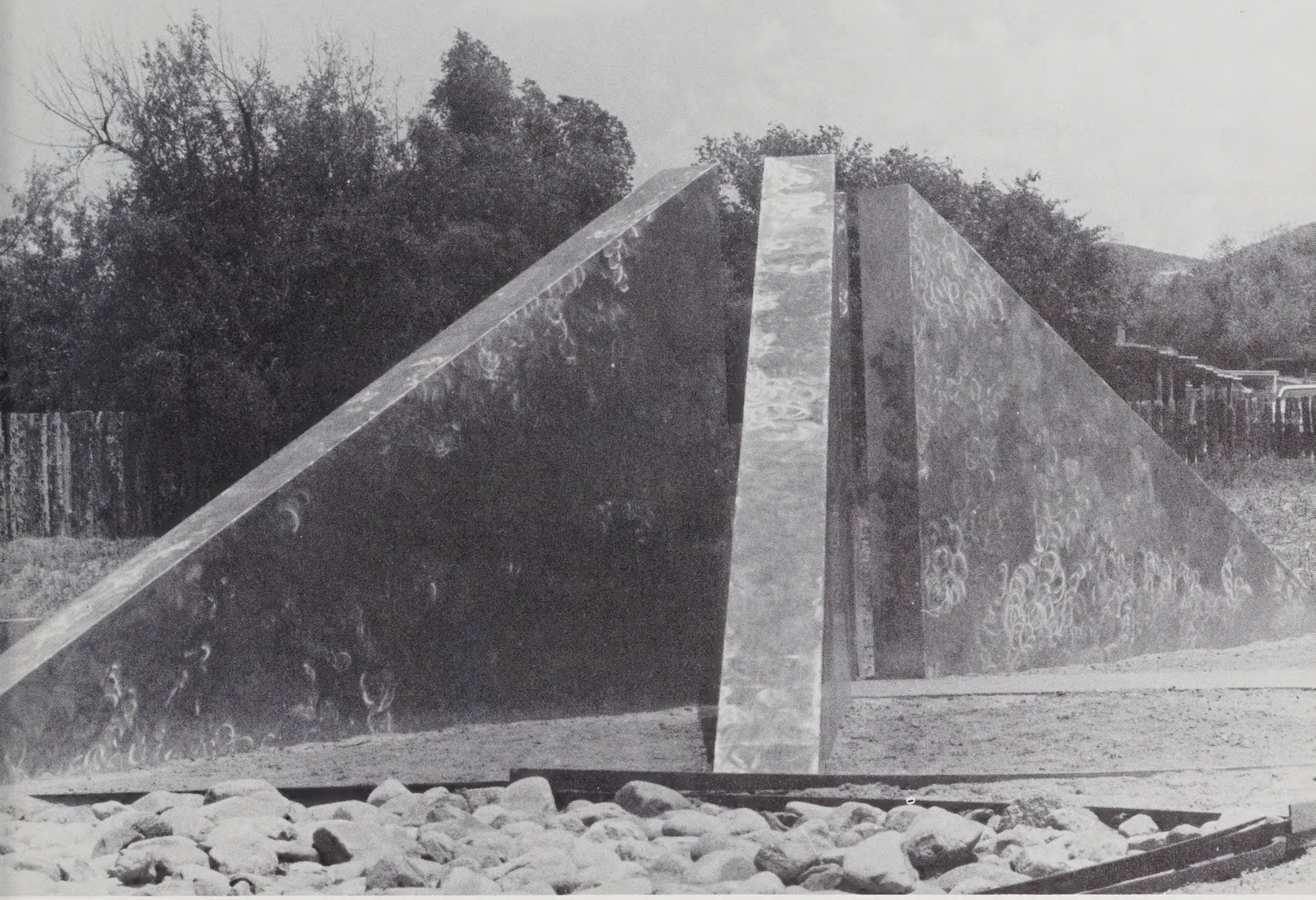
"Win some, lose some, somehow we keep flying," says Wallace. "It's true that a piece falls off now and then. But, by golly, we have kept her in the air so far!" There are times when he seems harassed, and though there was one point a year or so ago when he seriously contemplated taking a job in industry, one senses that despite its problems, Wallace would not give up his work at the metal museum unless there were absolutely no alternative. The museum provides, above all, an opportunity to create a very free and open place where hard, creative work is encouraged, where sweat and dirt are a part of life, as is beauty. The combination seems to suit James Wallace and makes a life of flying without a net worthwhile.

F. Jack Hurley is a professor of history at Memphis State University and has contributed to such magazines as *Fine Woodworking.*



Anthony Wooten, *Firebasket,* mild steel, from the exhibit "Towards a New Iron Age." Photo: courtesy the Victoria and Albert Museum, London

The Shidoni Foundry and Gallery by Elizabeth Skidmore Sasser



Mandala by Paul Jenkins: steel, earth, sand, and rocks (to be a 125' circle) segment is 15⅝'; height approx. 7'. Photo: E.S. Sasser

Like a pot of bronze at the end of the rainbow, the Shidoni Foundry and Gallery are found by following a winding lane called Bishop's Lodge Road which curves between Santa Fe and Tesuque, New Mexico. The leisurely route is covered by arching trees and flanked by horses grazing in green pastures. The goal is announced by the Shidoni totemic sign, a tall wood and metal construction that seems to encompass man, flower and sun in its design. Made by Doug Coffin, the totem reaches out toward the sky where clouds skitter and form endless soft sculptures throughout the New Mexican summer days.

The foundry was activated in 1971; Tommy C. Hicks, founder and president of the establishment, explains that in those days, "there were only two people running the whole organization, from mold making to the finished bronze, and all in a chicken coop!" Whether the latter location can be strictly interpreted or not, there is no doubt that the growth pattern of Shidoni has been phenomenal. The Gallery opened officially in 1975, a year also marking the "1st Annual Outdoor Sculpture Show." Today, the staff has grown to include 30 people engaged in all aspects of the enterprise, from business management to casting and finishing the bronze pieces, and, recently, in the making of wooden bases for the display of the metal sculptures. Small sculptures find a haven in a spacious semienclosed porch, while larger pieces occupy the gently contoured fields surrounding the earth-hugging adobe structures. The Gallery and Foundry are housed in a complex of buildings which covers more than 8,000 square feet and there are plans for further expansion in the 1980s.

Shidoni projects a welcoming, laid-back atmosphere where people are allowed to make their own discoveries. On Saturday afternoons, visitors are invited to watch bronze pourings which are scheduled every hour. One side of the foundry building is thrown open to allow circulation of air. The scene is dominated by lunar figures in silvery asbestos moving with intense concentration. The foundry master is Dan Anthony, but Tommy Hicks, like a reincarnation of Merlin, often presides over the pouring. The sculptor/alchemist directs the hands guiding the heavy crucible with its glowing fall of metal which slips in an incandescent stream toward the ghostly white ceramic molds.

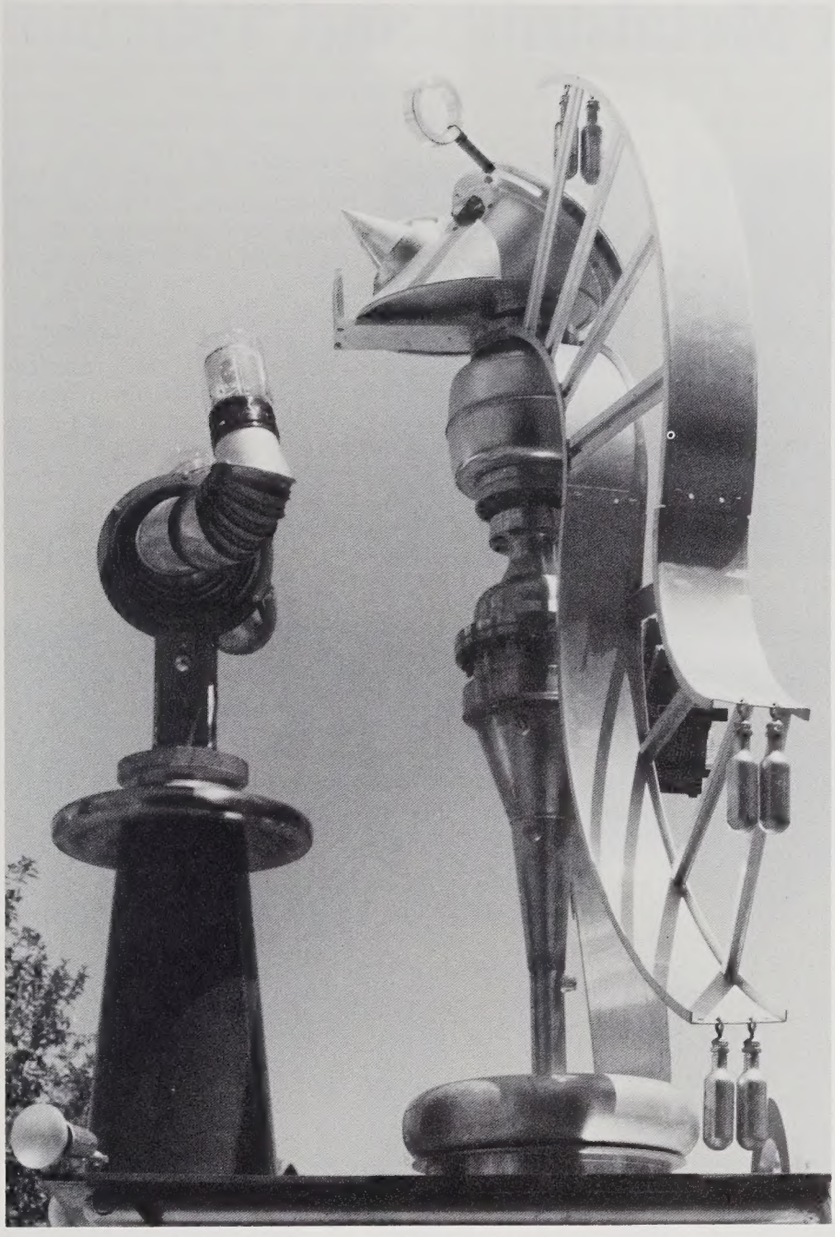
The procedure used at Shidoni follows the classic "lost wax" process. First a flexible mold of plaster is fashioned from the piece to be cast. A clay spacer is then placed between the original work and the "mother mold," so that synthetic rubber can be poured in the aperture to insure that all the subtle details of the sculpture's surface texture are meticulously captured. When the rubber mold is completed, it is first painted with hot wax to account for every small configuration; then wax is poured into the form. After the wax cools, the model is removed and checked for accuracy against the original piece; at this stage the artist can make corrections. The rubber mold is carefully stored for use in other castings of a "limited edition." To the wax model a funnel of wax is added to provide a channel for pouring the molten metal and wax sprues, and vents are attached to provide passages for the overflow in the "wax melt" and to assist in conducting the metal to all parts of the mold during casting. The wax figure is dipped into baths of ceramic

Shidoni Gallery. Photo: E.S. Sasser

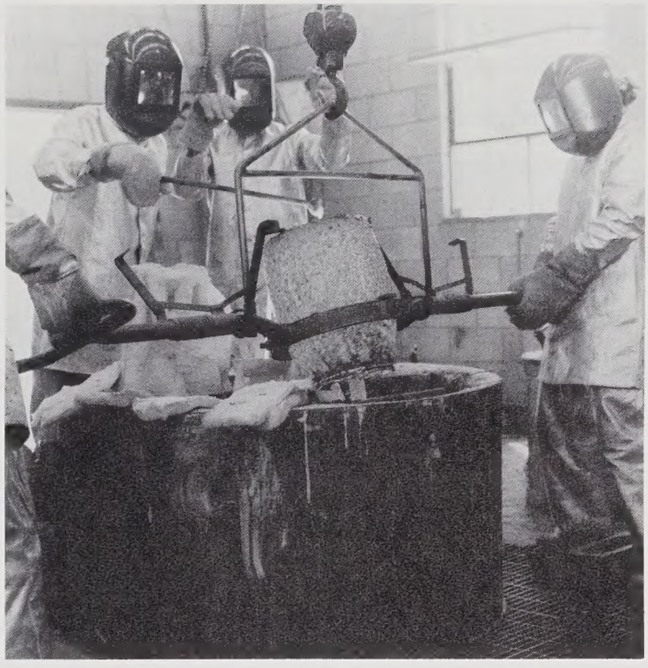
solution and fine sand to produce a strong, many-layered ceramic mold, which is built to a thickness of ¼". The "burn out" is accomplished by placing the shell mold in an oven heated to 1500°F. Once the wax is melted away, the mold is ready to receive its trial by fiery bronze. The pouring operation completed, the metal is allowed time to cool and solidify; then the ceramic shell is broken open and the casting removed. Refining the raw piece is ticklish and demanding. The bronze "pour cup" and sprues are removed and the work is given to a skilled "chaser" who must recreate the textures of the original sculpture on the rough areas left after the rods have been trimmed from the surface. When the refinements are completed, the bronze sculpture is sandblasted and made ready to receive the color, or patina, requested by the artist. At Shidoni, both hot and cold chemicals are available to provide the right tone quality. Finally, the piece is sealed with a thin coating of wax to keep the patina from changing over the years. A certificate is filled out, for the artist's records and those of the foundry, to document the provenence and description of the piece and a statement of the exact weight of the casting. This acts as a safeguard against *surmoulage* (a casting made from a bronze sculpture, rather than from the sculptor's model) and other fraudulent practices which plague the art market.

The Shidoni Gallery is under the direction of Andy Jenkins and his assistant director, Jonathan Carleton. Jenkins is credited with the initial idea for the summer outdoor sculpture exhibition. The first of these events, seven years ago, displayed 45 pieces by 12 sculptors. In 1981, 110 artists were represented by 405 pieces of sculpture, located either in the porch shelter or installed on 13 acres of land. Geographically, the work traveled to Shidoni from Los Angeles and Boston, and as far afield as Alaska and Canada. Some of the sculpture arrives by invitations issued to those who have exhibited in the past; other sculptors are asked to fill out entry forms and to submit slides of their pieces for the consideration of a jury. There is no entry fee.

The 1981 show was given a western theme, emphasized by John Fincher's poster of a giant spur against a blue sky. Among the sculpture exhibited were some obvious allusions to western imagery, for example Jack Smith's *Lizard Boot* curved and "tooled" in marble and Steve Linn's life-sized wood carving of the rear end of a Cadillac jacked up for the chore of changing a wooden tire. The Wyoming license plate and bronze cast cowboy hat verified the title, *Broken Down on the Road to Cheyenne.* The realistic thrust of the theme, however, was more often bypassed in favor of abstractions touched by symbolism, and created in media ranging from ceramics to bronze, including the polarities of granite and welded metal. In an arid region, John Massee's steel and brass gateway rose like a Japanese *torii,* oozing drops of water form its plated seams. It assumed a magical life activated by changes in weather. The gray, striated planes dematerialized against hovering storm clouds and reemerged as a mighty bulwark on a hot, cloudless day. Jim Oberlander's *Billboard* in steel and glass reflected the notion of a mirage, while the tall, elegant, white painted steel *Chalice,* constructed by John Farnham, lifted its prongs like



Two figures from *The Last Salt Talks* by T.A. Price (details). Photo: E.S. Sasser



Casting at Shidoni Foundry. Photo: E.S. Sasser

Billboard by Jim Osberlander: glass and steel; 7½' high by approx. 6½' wide. Photo: Sara Sasser

the leap of a diviner's rod, or a cup appealing for rain. Two curvilinear welded steel posts with an implied "keystone" enframed a welcome or a *Return*, as Tommy Hicks named his monumental sculpture.

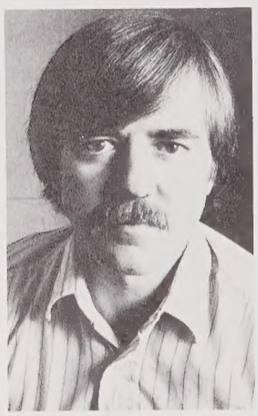
In a more ominous and unexpected idiom, T.A. Price drew upon surplus from Los Alamos—casings from hydrogen bombs, nose cones and the discards of science—to put together his quixotic characters from some metallic universe. The tableau was labelled *The Last Salt Talks*. Price described his assemblage "as machines coming together after everyone is blown away." The six figures were introduced as two "superpowers," one "monolith," an "umpire with forked tongue," and "two monitors." The gathering was blatantly kinetic, ringing and bleeping in the breeze, parts swaying revolving and clattering like the endless debate in a hall of nations. With the presence of this team of experts, the earth seemed safe, but not exactly sane, which may indicate a change for the better.

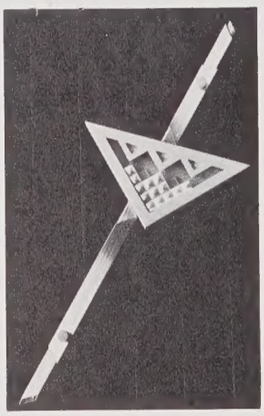
The landscape, which plays host to the large sculptures, is casual and clad in its natural contours; old trees take on the guise of *objets trouvé*. Arranging and installing the pieces in the open air, far from confining walls and concrete, must provide one of the most creative and rewarding activities of the exhibition. Jonathan Carleton expressed his pleasure, and that of all of the staff, in the provisions which are made for tours for the handicapped (or those handicapped with cameras). Golf carts lie in wait to move off across ditches and small bridges, huffing along from one spot to another. There are also tours arranged especially for the blind. Sculpture more than any other media introduces a variety of sensory experiences: kinetic motion, vibrations producing a cacophony of sound, tactile sensations inviting participation by those who see with their fingertips. At Shidoni, large and small sculptural planes reveal endless juxtapositions of texture, while the sounds of creaking and whirring parts are joined by splashes of water leading to fountains. One of the most stimulating textural revelations for the enjoyment of eyes and hands at the 1981 exhibition was Paul Jenkins's *Mandala*, a handsome geometry of steel wedges rising like an extinct volcano set in the midst of a Japanese sand and stone garden. The segment assembled at Shidoni represented only one-eighth of the projected, but as yet unassembled, whole. It afforded a preview of what may be one of the most poetic and comtemplative works of sculpture to be evoked by the 1980s.

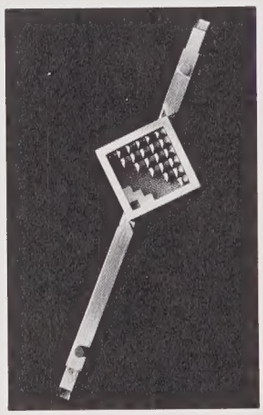
Because of the changing light and shadows and nuances of color that occur over the course of a day, Shidoni's sculpture fields are kept open from early morning until sunset. Carleton explained that many people return again and again to observe the interaction of sculpture and landscape marked by the passing hours, as well as for the pleasure of sitting on the grass and enjoying the panorama of sky scenes and shifting sun streaks on the contours of the sculpture. Victoria Franklin expressed this kind of communion in a poem written in June 1980 about "a piece at Shidoni." She observed, "Ideas develop between place, piece, and me. An attitude toward nature is explored and expressed. . . . The piece works at many levels. It is not a sculpture of something. It is itself" (*Shidoni Showtime*, Vol. 1, No. 1, 29 June 1980, p. 10).

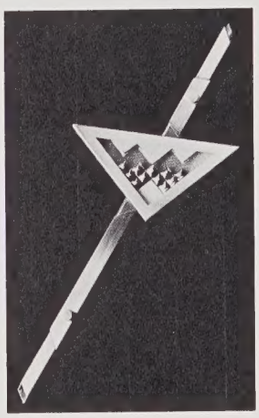
Roger Millar: Scottish Metalsmith and Teacher

by William Ard

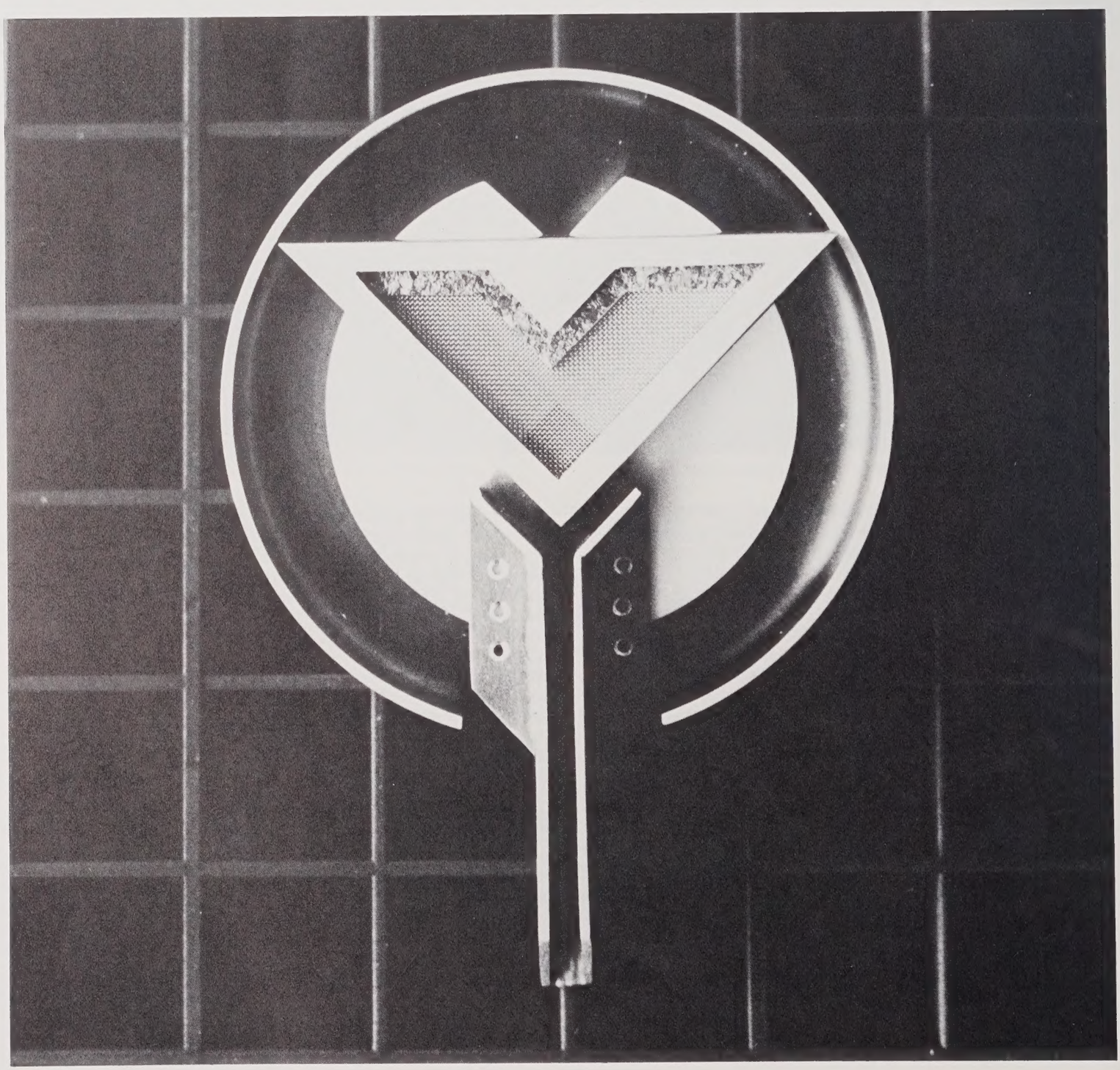








From left to right: Roger Millar; *Pin*, sterling and fine silver, brass, titanium, stainless steel, 5¼"; *Pin*, sterling silver, brass, anodised tantalum, stainless steel, 4½"; *Pin*, sterling and fine silver, brass, stainless steel, titanium, 5". **Below:** *Pin*, sterling silver titanium, stainless steel, acrylic, 2¾"



The School of Art at Montana State University enjoyed the priviledge this year of providing its metals students with a totally fresh viewpoint from outside our American university system. This cultural crosscurrent came in the form of Roger Millar, on leave from his post as head of the silversmithing and jewelry department at the Duncan of Jordanstone College of Art in Dundee, Scotland.

Duncan of Jordanstone was founded in 1892 and has diversified since the 1950s to include what we in the United States call the crafts. The School of Design, of which silversmithing and jewelry is a part, now claims about 250 full-time students. Millar's department employs two part-time assistant professors and a full-time "technician," who is on hand on a permanent basis to help students with technical problems.

A selection of Roger Millar's work was on display in April at the Fine Arts Gallery at MSU, giving the students and faculty a chance to see the results of another country's educational philosophy. The exhibition included 14 pieces, bridging the move from Scotland to the Rocky Mountains, from simple tubular pins to complex geometric constructions. Millar favors involved, three-dimensional compositions, revealing patterns within patterns. Color, texture and transparency are all used to differentiate the layers and serve as subtle milestones to draw the viewer inside the pattern. Most often the pieces are constructed like a Renaissance chalice, with whole assemblies being held together by a single pin or rivet. All the findings are straightforward engineering, elegant in their simplicity.

Reflecting an involvement in geometric precision and simplicity, the work has a European feel. Yet in his choice of materials Millar displays a typically American attitude toward experimentation, using plastics, titanium, machined elements and even found objects. Also familiar is an overall emphasis on design over intrinsic value in the use of sterling and brass as principle materials for fabrication. That Millar's work has a European flavor is evident until, talking with him, you realize how nebulous an adjective "European" actually is. It's analgous to the assertion that work from RIT is somehow "typically North American." Millar is influenced by traditional Scottish design concepts—he hastens to add that "traditional Scottish" does not imply Celtic. (We are probably more influenced by that age than they.) Again, that would be like calling Navajo design "traditional American." His Scottish background is, in part, an engineering tradition: a belief in strong forms, practicality and a proper way of doing things. It's a design concept rooted in tradition, yet innovative. "Scots are always looking for a better way of doing things," he says, "but, as they say, 'we do not suffer fools.' You will notice Rococo never caught on in Scotland."

Millar's geometric style comes from this background and an interest in mechanics and industrial processes. Most important, he says, he is influenced by the properties of the materials themselves. Asked about the similarity of his work to that by other Europeans, such as Claus Bury, he says the concepts stem from similar cultural backgrounds but "we're not so serious-minded as the Germans, not so locked in by the system." In fact, Millar's work has an experimental, almost playful feel in it's simplicity, reemphasizing the fact that what we call European spans not only a dozen or so separate cultures, but hundreds of individual metalsmiths.

Millar feels that one influence on his geometric approach could be the turn-of-the-century architect Charles Rennie Mackintosh, who designed the Glasgow School of Art where Millar first studied. Mackintosh anticipated the De Stijl group in Europe, balancing voids and solids in architecture similar to the paintings of Piet Mondrian, and exerted a huge impact on European design and architecture.

The conceptual conflict in American universities about the status of art versus craft drew a blank with Millar. Asked if he calls himself an artist or jeweler he referred to a quote by C.R. Ashbee speaking of jewelers as a "narrow and tiresome little aristocracy working with great skill for the very rich . . ."

"I always liked that," he says. "Actually, I believe in jewelry for jewelry's sake, which is body adornment. After all, there's no crime in that. Whatever the motive for its creation, all art is essentially decorative: paintings are surfaces to enhance surfaces, sculpture needs to have it's space, and jewelry is made to enhance the wearer."

There's no insult to an artist in Scotland to be considered a craftsman. "To be a craftsman is a state of mind, not a collection of skills," Millar believes. "Our strongest tradition is a profound respect for the work itself. You take inspiration from your materials and you work within their limitations. That's artistry." Millar views himself as a teacher first and then a craftsman. "We're taught in Scotland that the most important part of teaching is the teaching. There's a lot less pressure there for a teacher to make a name for himself outside of the system—that peer pressure to do something new every year. We tend to feel that if an international exhibition will make you a better teacher, that's wonderful, but if playing golf on Tuesday helps, that's equally wonderful."

"My main objective is to constantly find new ways to teach my students, to make my message purer over the years," he says. "When you go back to school every day it's hard to get arrogant about your work."

In viewing Millar's work and the work of his students in Dundee, an ecclectic, almost "American" diversity is apparent. As it happens, the emphasis of our educational systems are quite similar. "The absence in Scotland of a strong, centralized jewelry manufacturing base, such as exists in London, has meant that the training of our jewelers and metalsmiths has always been the responsibility of our art colleges," he says. As in the Untied States, while there are certain shortcomings in technical training, "this kind of education has the advantage of offering the students the opportunity to develop in a creative environment."

Another factor in Dundee's diversity is its access to a range of cultural experiences. The United States is a huge melting pot, but it is isolated by half a world from most of the other important art centers. Millar's students, on the other hand, can be in London in six hours, Pforzheim in 12, and can weekend in Paris without recourse to a Swiss bank account. "The proximity of the European countries is hard for Americans to grasp, really, given the sheer size of the States. For instance, a drive, for you, from Los Angeles to Philadelphia would put a person from Dundee somewhere in Istanbul."

That freedom of access is encouraged in Dundee and the student work reflects it. The Duncan of Jordanstone metals department was, in fact, one of the charter subscribers to *Goldsmith's Journal.*

The greatest difference between our systems lies in the emphasis, there, on making the student self-sufficient upon graduation. Courses are required in business administration as well as accounting and marketing to make the graduate "immediately competent." Millar estimates that fully 50% of his graduates are set up in private business. There is also an admirable degree of government support for the arts in Scotland: upon receiving a degree, a graduate may apply for a maintainance grant from the Scottish Development Agency. This financial support lasts for one year while the graduate follows his own, approved plan to start a business, including a 50% discount rate on all business-related tools and equipment.

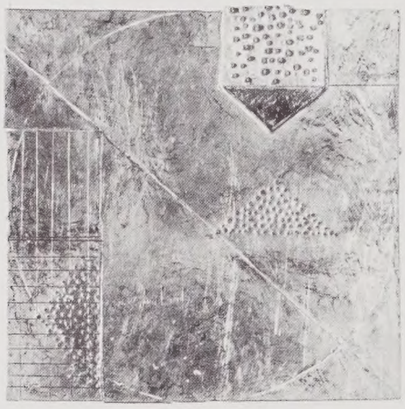
Millar received his degrees from the Glasgow School of Art and the Royal College of Art, two different schools of thought that prepared him well for what he termed the "eagerness" of the American students. "Perhaps paying a rather high tuition makes them want to get all they can from their education," he says. "American students question everything; they're always looking for alternatives—it really keeps you on your toes."

For their part, having mastered the Scottish brogue, Millar's students quickly discovered that they weren't dealing with any Teutonic academician, despite his European credentials. Millar's happy dedication to education and belief in free inquiry made the year a growing experience for everyone involved. The respect accorded him by his students here attests to the fact that educational exchanges such as these can greatly enhance the learning experience.

William Ard is a metalsmith and occasional writer for this magazine.

Exhibition Reviews

Reinhold Reiling
Schmuckmuseum, Pforzheim, West Germany
April 24–June 20, 1982
by Ann Grundler



Reinhold Reiling, *Brooch,* 18k gold, 1975

Professor Reinhold Reiling turned 60 this year and to honor this great artist, goldsmith and teacher the Schmuckmuseum, Pforzheim staged a retrospective exhibition. One of the most influential teachers in the field in Germany, Reiling has also designed for the Pforzheim jewelry industry. His influence is further felt through his students and the work he made popular.

At the reception for the exhibition, Alan Revere, founder and director of the School of Jewelry Arts in San Francisco, commented on the international repercussions of the work of Reinhold Reiling: "As a major force within the 'German School' of jewelry design, Professor Reiling has had a tremendous influence on the world-wide evolution of modern jewelry. From 1957 to the present, he has made significant contributions as an artist, jewelry designer and teacher. His students come from around the world to be near this gifted and energetic man. I am thankful to have known and studied with Reinhold Reiling. His classes were the cradle of my development as a jewelry designer."

Reinhold Reiling, *Brooch,* white and yellow gold and diamonds, 1973

The jewelry, handsomely displayed in the new wing of the Schmuckmuseum, dated mostly from the 1960s and 70s. The fluid, biomorphic pieces from the 60s looked timeless, refreshing, transmitting qualities beyond that which I had derived from photos of his work published in books on jewelry in America. In the later 60s and early 70s, he created more geometric shapes, sharp lines, square diamonds. In this work gold inlay was a dominant design aspect.

The Museum issued a handsome catalog, including 30 plates of the work. It also contains letters to Reiling from his colleagues of 25 years: Klaus Ullrich; former student and now teacher, Ruedinger Lorenzen; Gerhard Bott; and Dr. Fritz Falk, the Museum Director.

Outside Reiling's exhibition five of his recent students showed their sensitive work. A second catalog appeared with the work and biographies of 31 of Reiling's former students. The two catalogs, costing DM10 ($12) each, are available from: Schmuckmuseum, 7530 Pforzheim, West Germany (surface mail).

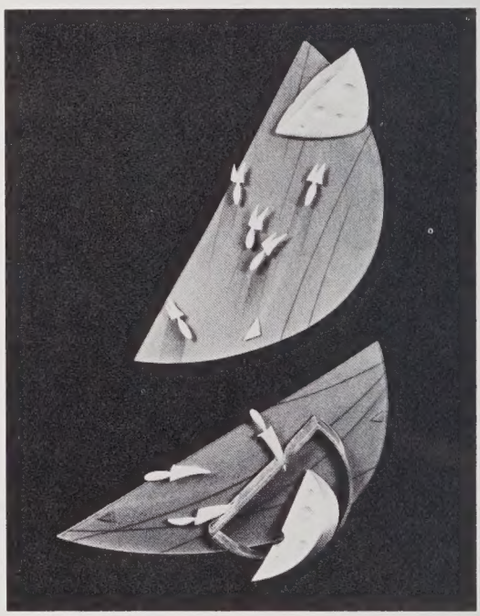
Bruce Metcalf: Pictures from the Floating World
The Gallery, School of Art, Kent State University, Kent, OH
March 15–April 2, 1982
by Joanne Calve

"In a sense my works can be called conservative, in that they are very much discrete objects or traditional drawings. They do not push at the limits of art. Even the things I'm saying are usually propositions that are not new—like, 'You're better off if you keep an optimistic frame of mind.' That's a familiar statement, something your mother might say, but I sincerely believe it is true. I'd rather communicate a single modest truth than a thousand fashionable irrelevancies. At the same time, there are levels of innovation and exploration in my work. There's something about creativity that expresses the human spirit in a way nothing else can. The creativity occurs in more than just the answers that the works present. It's not just the philosophy, or the visual levels, or the technical solutions. It's in a combination of all those levels—the works are evidence to my tentative solutions to the puzzles of life."

In a broad sense Bruce Metcalf is not a conventional metalsmith; he makes pins, small sculptures, reliefs and drawings. He works primarily with wood, metal, plexiglass and pencil drawings, using imagery drawn from personal experiences and beliefs. As a student at Syracuse University in 1970, Metcalf rejected art-about-art issues and spent four to five years making toys and small sculptures out of metal and plexiglass. Since that time, a more defined sense of precision and intention has become apparent in his work. His unique style of synthesizing strong personal statements in a highly imaginative manner emerged in the mid 70s. One strength of his work lies in his ability to communicate directly to and be easily understood by the viewer while maintaining distinctly personal iconography.

Most of Metcalf's three-dimensional works are startling because he displaces mundane objects from their familiar surroundings into the unfamiliar manifestations of his imagination. *You're in Utopia* was made while teaching at Colorado State University in 1977. This small billboard of the same title, embedded in a heap of wax rice, suggests that despite bad cafeteria food, college is still an ivory tower existence. The billboard looks like one from any tourist-trap town and the same sort of wax rice can be found in the windows of Japanese restaurants. A piece such as this forces the viewer not only to reacclimate his visual perception but also to rethink his ideas about the commonplace. As the familiar meshes with Metcalf's fancy, his audience is startled into a fuller awareness of his intent, and a more meaningful relationship is established.

"My first art turn-on was Funk Art which was about joke making. I liked the way it made whimsical and dumb juxtapositions. I also liked the idea that there is an art that people can respond to in a direct and emotional way." Unlike a lot of funk artists whose work made a joke but had no other substance, Metcalf distills several levels of meaning in each of his pieces. Visual wit and word play are the most accessible. But succumbing to the exigencies of them robs the work of its rich narrative symbolism. Underneath the quipping lies imagery of his own psychological and spiritual landscape. *Auto-flagellation on a zig-zag wall* touches upon a familiar theme in Metcalf's work—self-induced pain and self-constriction. In this small sculpture a figure is struck from behind by a whip it is swinging. Anyone who can remember moments of unnecessarily limiting their own potential will empathize with this piece. "Sometimes we interpret people and culture as wanting us to be what we are not. . . . Spiritually we often remain in the dark because we don't strive for other levels, which is self-restrictive and in the end self-imposed."

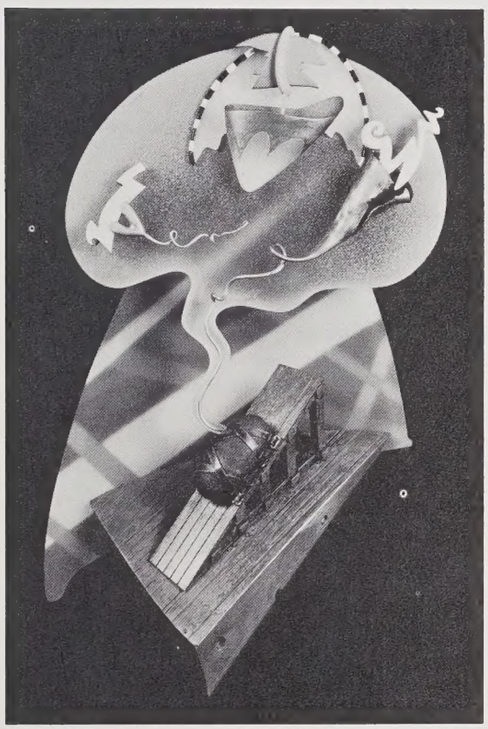


Bruce Metcalf, *Unprotected Moon/Protected Moon,* acrylic, silver, copper, brass, drawing on mylar, each 4¾" h., 1981

Pain, whether self-induced or otherwise caused, is an integral part of Metcalf's work. In the pin *Unprotected Moon* small knives threaten a moon that looks like the cheese wedge from a child's fairy tale. He juxtaposes what are clearly pain-inducing objects with apparently innocent ones, resulting in conflicting impressions of violence and innocence. Psychologically it suggests that we often have only a tenuous protection against pain.

Only Partly of this World depicts metaphorically that the world of the imagination is freer

and more enticing than reality. A small rock symbolizing self is tied down to a plank while above it vessels float unfettered. We find relief from everyday realities and routines by escaping on flights of fancy or indulging in daydreaming. This same juxtaposition is present in Metcalf's acrylic and colored pencil drawings which he began in 1980. Formally they resemble Japanese woodblock prints with a similar shallow layering of space and tightly cropped framing. Symbolically they are about his continuing struggle to free himself from restraint and to understand the sources of his pain. But for the first time in his work seeds of optimism emerge and the theme of the injustice of pain recedes. "It's clear to me that I have to make my own good frame of mind. The solution to being negative and unhappy is to change yourself, your mind." In *Testimony to the power of positive thinking* small objects have broken through metal bars and freed themselves. But in actuality the objects are small enough to escape without breaking the bars. This seems to suggest that Metcalf has been his own worst enemy and that he had the ability all along, as have we all, to escape pain and restriction.



Bruce Metcalf, *Only Partly of This World,* bronze, copper, brass, silver, acrylic, paint, 8 x 5 x 1¾", 1980

In the aftermath of the tumultuous 60s, journalist Joan Didion wrote about how the modern consciousness has adjusted to living in an insecure, unharmonious world. She says in her book *The White Album* that "We live . . . . by the imposition of a narrative line upon disparate images, by the 'ideas' with which we have learned to freeze the shifting phantasmagoria which is our actual experience." It is a particularly modern syndrome to assign meaning to the seemingly inexplicable, to tell stories as a way of ordering our chaotic world and to respond with anguish when faced with overwhelming doubt. Although Metcalf's work tells the story of one person at particular moments in his own experience, his responses are intended to be universally understood. In his work, Metcalf responds humanly with pain, humor, optimism, pity, but most importantly with honesty—he posits no solutions, nor any grand schema for order or happiness, but rather reflections on these conditions as he sees them.

Bruce Metcalf has the superb ability to clarify and then articulate impulses that we often experience as only vague feelings of unhappiness or discontent. After seeing his pieces, an affinity emerges for the work and the man behind it. His work is a contribution of lasting value because he has helped us to define what it is to be an aware, fully alive, responsive person in our uncertain world. "I see myself on a path, but where it leads I don't know. My pieces are about particular areas of the path. I don't see them as insignificant or small, but as a step along the way."

A catalog of this exhibit is available from The Gallery, School of Art, Kent State University, Kent, OH 44242.

Enamel Today

The Northwest Craft Center and Gallery,
Seattle Center, Seattle, WA
April 2–30, 1982
by Ramona Solberg

"Enamel Today" was an outstanding showcase for the excellent contemporary enameling being done in the United States. Exhibited in the Northwest Craft Center, it was only a few hundred feet from the site of the Pacific Enameling Symposium (April 9–11, 1982) and provided participants with inspirational motivation.

Jurors John Paul Miller, Mary Lee Hu, John Killmaster and Harold Balazs made their selections from actual pieces and chose 104 items by 79 artists. Though the show placed special emphasis on large-scale pieces and spontaneity, it was the smaller, more precisely scaled objects that made the exhibit a winner.

Beautifully understated pins by Peter Rudloff (WA), Herb Friedson (KA), Ken Rockwell (FL) and Thomas Farrell (PA) were a marvelous foil for the patterned Gothic quality of Pat Bergstraesser's (FL) shallow cut-edge champlevé bowls and Pat Strosahl's (WA) tongue-in-cheek pictorial icons. Hal Hasselschwert's (OH) small basse-taille brooch with its engraving under the transparent enamels as well as on the exposed silver had the look of a beautiful metallic brocade fragment. Close relationship of colors kept it from becoming garish.

Martha Banyas, *Gaudy Fraud* wallpiece, cloisonné, Limoges enamel on copper, 4½ x 7¼ x 1"

The most outlandish piece in the exhibit was an electric crab with blinking red eyes by John Peters (KA). It was probably more fun to make than most pieces in the show. Another overexuberant piece was *Bell A Buzzard,* a necklace by Peggy Simmons (FL). The central element was beautifully engraved and enameled with great sensitivity but completely overwhelmed by the hinged chains, tassels, metal feathers and bell cascading from the central element, to say nothing of the handsome fabricated silver beads. (The central piece and one hinged element with the feathers would have made it a strong, effective piece of jewelry.)

One of the most unusual and sensitive pieces in the show was the delicate but powerful ceramic pencil drawing on matte white enamel enriched with brass elements worked on grisaille by Mary Ann Papanek Miller (TX). Martha Banyas (OR) again worked her magic with fantastic flesh tones on her female nude with a frighteningly real baboon's head. Connie Brauer's (CO) deep opalescent enamels looked very feminine and Art Deco as they surrounded a mounted opal, and another romantic image was presented in the beautiful enameled/granulated *Luna Moth* by John Paul Miller (OH). Thinking about the long-time masters of enamels, it was exciting to see a piece by Margret Craver (MA) in the exhibit.

Subtle colors and fine detailing on large panels characterized the work of J. Esteban Perez (NY) and Christina Gibson Sears (CA). Crisp, bright colors with silk-screened pattern gave the work of Jo Ann Tanzer (CA) an architectural quality. The same crispness of design and pattern was used on a much smaller scale by Peggy Hitchcock (WA) in her two geometric, Boschlike compositions.

The work of Cheryll Leo-Gwin (CA) and Kristin Anderson (WI) were full of personal symbolism that was visually quite overwhelming to the uninitiated. Gwin's *Tying Back the Hands of Time* had enough visual humor in her clock allegory to catch the interest of the viewer. Barbara Satterfield's (PA) *Woman—Eternal as the Sea* and Michelle Catalfano's (CA) *Hat Dance* presented a more general sort of allegory. The prize for poetic symbols and titles, *When I First Knew Her, She Was a Mourning Dove,* must go to Pamela Harlow (WA) who entered two beautifully subtle compositions.

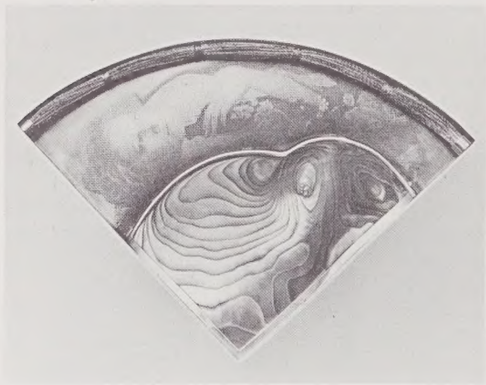
Carl Sundberg's (PA) unique wall piece was a dazzler in a Vasarely mode. Precise enamel stripes under a glass with more hard-edge stripes created a pleasing optical illusion. Another wall piece that was equally pleasing but abstract expressionistic in concept was Sherry Schrut's (CA) *American Purse Series #6.* The seemingly casual arrangement of enameled pieces on stitched black leather had great impact.

The total show was a strong one, and the jurors must have had a difficult time making decisions as to the award winners. Pamela Harlow (WA), J. Esteban Perez (NY), Peter Rudloff (WA) and Michael Williams (FL) were the recipients of the Merit Awards. Juror's Choice Awards were given to Laurie Hoskins (CA), Peggy Hitchcock (WA), Ken Rockwell (FL) and Cheryl Sapino (MA).

Just a word about the Pacific Enameling Symposium: This gathering of enamelists, enthusiastic learners, was assembled by Roland Crawford in a seemingly effortless way that was marvelous to see. Demonstrations, on-hands enameling, slide shows, films and lectures on business practices went on three days, from 9 to 5, and it was a constant "giving" process. The demonstrators and lecturers were unusually generous with their time and information, and enamel suppliers had provided sufficient supplies for all to participate. It was a conference that will be long remembered.

National Metals Invitational 1982

Main Gallery, Fox Fine Arts Center, University of Texas at El Paso, El Paso, TX
January 22–February 21, 1982
by Trudy Berman



Eleanor Moty, *Fan Pin,* photoetched silver, abalone shell and silk thread, 4 x 3 x ½"

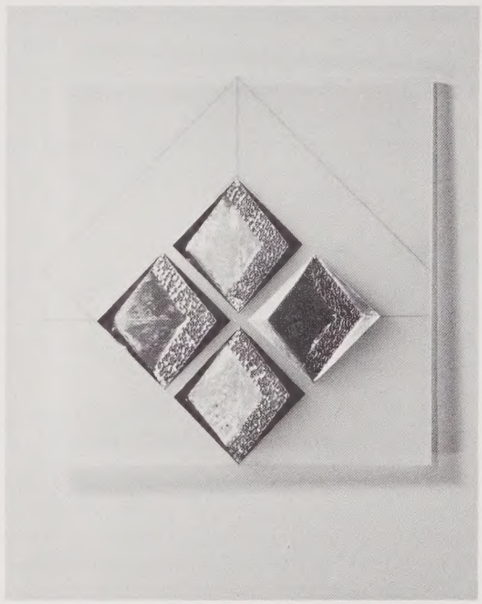
The deserts of far west Texas have a certain loveliness at this time of year, but it is one of dry browns and sameness. It was therefore especially wonderful to have the riches of the "National Metals Invitational 1982" laid before us. This show, assembled by metalsmith Rachelle Thiewes, brought to El Paso a number of the country's most significant metalworks. The following are observations on a few of the strongest impressions I formed while exploring these works.

Small though Brent Kington's two pins were, they had great power: primary forms in which an idea, a response, has been reduced to its most simple and effective expression. *Icarus,* suspended in time, the earthly tension in its steel arms immobilized by golden orbs and showered with molten gold solder, seemed poised at the moment before the fall. *WV* was a wonderful crudeness of steel moving into glossy gold, into the dull sheen of patina, delighting the eye and the intellect. The catches of both pins were cunningly devised, and a back view of *WV* made one hunger for the same of *Icarus.*

Two silver sculptures demonstrated that Thelma Coles has discovered her ability to soar. The silver in *Suspended Connection* seemed to blow in the wind: it billowed and swooped and suddenly dissolved as one moved around it. *Integral Connections* might have been an aerial framework, the interior of whose shimmering container sloped off toward infinity. One of the functions of art is to give shape to that element of human response that is indefinable by any other means, in other words, to give the intuitive a form. Thelma Coles appears to have mastered this process in these two works.

Harlan Butt's pieces conveyed intense feeling through an elemental contrast: each form was beautiful and visually perfect, yet each contained a written message of sorrow. *1001 Views of Mt. Mu: View #5* consisted of a simple white container, which, when opened, revealed an inner lid with words of quiet despair. A pale moth clung to the underside of this inner lid, below which lay an interior of lush coppery red enamel. *The Tree,* a mysterious tablet of tied copper pages fluttering in an unsensed wind, concluded its passage with the words: ". . . a vision of utter, uncontrollable hopelessness." One could visualize incense burning inside the deep-red fat little body of *Incense Burner,* smoke rising through the words engraved on its cover, wafting a vague discontent into the room.

Colette's enamels were of an incredible richness, both in their color and imagery. The indecipherable language, reminiscent of ancient glyphs, seemed familiar, as if one had read it in another life. The forms and color and writing all combined into a vague yet coherent impression of reincarnation.



Hiroko Sato and Gene Pijanowski, *Wall Hanging 2-80,* brass, copper, pencil, plexiglas, 12 x 12"

There was a raw splendor about Gene and Hiroko Sato Pijanowski's *Forms on Aluminum Field.* Rich yet unpolished mokume brooches lay on a seemingly inert aluminum plane. An enigmatic copper line and a suggestion of texture protruding from beneath the mokume were all that enlivened this plane, yet concealed beneath the brooches were areas of deep chiseling.

The days and years of thought and work by the 20 artists in this show were condensed and channeled through their works to the viewer, who, by the medium of the object, was able to see and feel as if he were another.

Metalwork 1982

Sponsored by the Washington Guild of Goldsmiths
Montgomery College Art Gallery, Rockville, MD
March 15–April 2, 1982
by Shelly Guggenheim

Virginia and Pennsylvania couldn't be more different from each other in many ways: topography, social structure, economics, politics. Yet jewelers from those states and three others, who are members of the Washington Guild of Goldsmiths, exhibit remarkable similarities in the guild's most recent show.

"Metalwork 1982" was a comprehensive and cohesive show of work by 41 jewelers. All exhibited substantial expertise in technique and design. And, with rare exception, all demonstrated the region's essential traditionalism—not necessarily the Federal influence that dominates the area's art and architecture, but a clinging to familiar forms, motifs and materials. The exceptions were notable, exhibiting, with some debt to their academic training, an independent vision and refinement.

Juror Mary Ann Scherr could not have been a more apt choice. Scherr, whose vast experience includes working in diverse styles and materials as metalsmith and designer, brought her teacher's eye to the task. She chose the best of the work presented, careful not to impose an alien esthetic. The result was a show of very broad regional representation, not a display of the juror's elite.

Most outstanding in the show were the works of Joke van Ommen and Gretchen Raber. Both European trained, Raber's work was dense, massive, constructivist; van Ommen's was light, minimal and inventive.

Raber's vermeil *Architectonic XI* brooch and *Architectonic,* a sterling, ivory and citrine brooch, exhibited good balance, strong design and surface contrast. *Architectonic* received a juror's special recognition. Less successful was her *Micro-Wrap,* a rather stolid piece with an interesting use of gold leaf on titanium.

Dutch-born van Ommen constructs utterly elegant work with unusual material combinations—rubber and stainless steel—and imaginative forms—a pin with a round needle. Her brooch with separate needle was fabricated of silver with copper stripes. An open diamond shape, its separate needle defined the horizontal axis. Scherr awarded special recognition to this piece, but it could have gone to any of her work as well.

Gail Goldman's award-winning pin made a subtle statement of balance and contrast with rarely used tortoise shell worked in combination with gold and pearls. Her quarter-circle silver and copper earrings were understated classics.

Butterfly Metamorphosis by Constance Gildea was a literal fantasy neck piece. Often, if poetic, works concerning nature are a bit cloying. Not Gildea's; it was a strangely lovely integration of traditional themes.

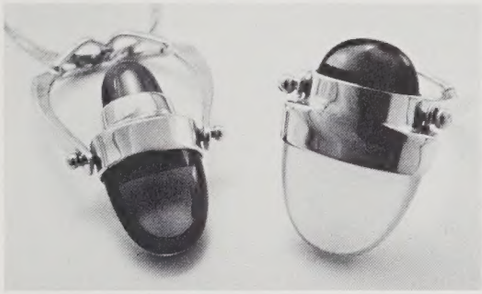
Constance Gildea, *Butterfly Metamorphosis,* Photo: Little Bobby Hanson

Also noteworthy were brooches by Roger Kuhn, which demonstrated a noticeable degree of excellence even if the designs were not particularly innovative. The undulating forms of Betty Helen Longhi's *Aqua Undulations* and *Sea Flower* were interesting for their dual uses: a necklace with a separate stand, a pin that could be worn in a different orientation as a pendant. Otherwise, her forms and compositions were competent, not lyrical, a bit overworked and dated.

The show was a landmark for the region. No slapdash presentation, as local shows are wont to be, it was well displayed, well lighted and well received by a sizeable opening-day crowd.

Gail Goldman, *Pin*, tortoise shell, gold, pearls. Photo: Little Bobby Hanson

Gabriel D. Ofiesh and Lee Angelo Marraccini
Creative Metalsmiths, Chapel Hill, NC
May, 1982
by C. James Meyer



Gabriel D. Ofiesh, *Ring/pendants*, 14k gold. Left: amethyst/rhodolite garnet; right: amethyst/rose quartz; fabricated pivoting double bezel on forged shank. Shank design copyright Ofiesh, patent pending

This show consisted of approximately 100 pieces, with rings, earrings, pendants and bracelets dominating, all in precious metals and stone. Both Ofiesh and Marraccini market their work through American Craft Enterprises fairs, so it is quite conservative, well designed, well crafted, functional and reasonably priced. After seeing so many "avant-garde" exhibitions, I found the honesty and lack of pretentiousness refreshing. Because both artists rely heavily on the use of stones, the single most impressive factor in this show was the use of color.

Lee Angelo Marraccini, *Earrings*, laminated black-and-white jade, forged 14k gold, 5/8 x 2 1/4 x 1/4"

The most exciting of Ofiesh's work was a series of ring/pendants. As rings they consisted of a light, open shank with a pivoting bezel-set or superimposed stone. When removed from the finger the stones could be pivoted into the plane of the shank; with a chain fed through the open shank, the ring doubled as a pendant. One series of three ring/pendants impressed me because of their rich use of color. Each contained two oval high-dome cabochon stones set sideways so they lay flat on the finger, and each used a deep purple amethyst opposed to, in the first, a light pink rose quartz, the second, a garnet and the third, an aquamarine. The amethyst/rose quartz combination was the most successful because the disparate size of the stones lent the most pleasing pendant silhouette.

Marraccini's strong background in lapidary work has allowed him to integrate stone and metal. However, instead of setting stones in metal, Marraccini has inlayed metal into stone in rich, vibrant color combinations, such as black jade versus the intense blue-green of azurite, or red-brown jasper opposed to blue lapis lazuli. His bracelet of black-and-white jade with 14k gold and fine silver stood out as a thorough integration of color, design and material.

Innovations/Craft 82
Bannister Gallery, Rhode Island College, Providence, RI
April 1–23, 1982
by Tim McCreight

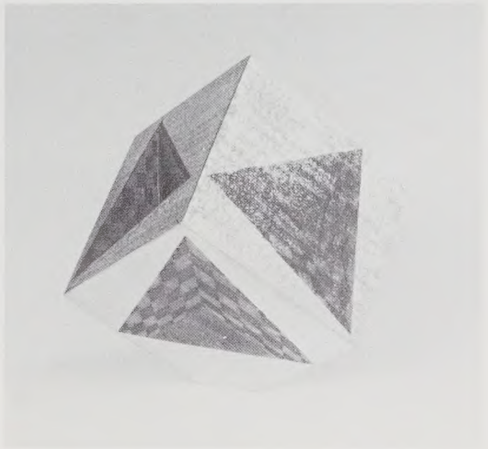
John Heller, *Brooch*, 2 1/2 x 7 3/4". Photo: Angelo Marinosci, Paul Yacovone

"It's not what you've got, it's how you use it." This sentiment might be attributed to Mae West, but was really spoken last week by a student of mine as we stood over the display cases at the "Innovations/Craft 82" show, an intercraft exhibit of contemporary New England fibers, ceramics, woodworking and metals. The reference was to the use by many smiths of bits of metal that might have in other hands ended up in the scrap box. In a search for texture and interplay of color, several of the pieces used unexpected materials like steel, bone and (it's true) a stuffed hummingbird. The cumulative effect observed in this show was a heightened respect for subtlety and a furthering of the traditional definition of metalsmithing.

Only about half of the metal objects were made for wearing, the balance being wall and table sculptures. The latter shared a geometric theme, from Patricia Daunis-Dunning's two-inch cube of mixed metal checkerboard images to Curtis LaFollette's four-foot steel and wire grids. David Freda's complicated wall units also offered new uses for traditional techniques and materials.

With all this stretching of boundaries, it's worth noting that the show also presented an impressive supply of attractive, well-made jewelry, including work by Vincent Ferrini, Anne Besse-Sheperd, John Heller and others.

A 22-page catalog of the exhibition is available for $3 from: Bannister Gallery, Rhode Island College, Providence, RI 22908.



Patricia Daunis-Dunning, *Cube*, 3 x 3 x 3". Photo: Angelo Marinosci, Paul Yacovone

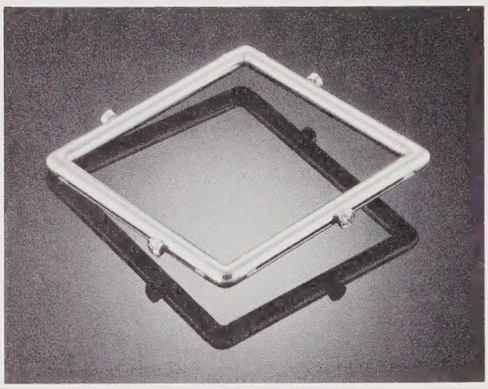
Production Lines: Art/Craft/Design
Philadelphia College of Art, Philadelphia, PA
March, 1982
by Karl Bungerz

This show was comprised of production ware by five or six craftsmen in each of the three mediums: glass, ceramics and jewelry. The intent to exhibit variety within the singular theme of sales-oriented work was achieved. All participants have had training in the academic and artistic community and are equally successful in the marketplace, a relationship that industry and the public often dissociate. The six selections of jewelry on display exhibited diverse sensibilities but similar concerns: good design, good manufacture, wearability. The individual esthetics were well integrated and aptly expressed the stated interests of the artists.

In this show Whitney Boin and Angela Cummings clearly adhered to the traditions of fine jewelry. Rich in gemstones and precious metals, their work was impeccably smithed and set. Boin's pieces, prototypes for limited editions allied technology and its elegance with a concern for wearability. This synthesis produced purity of form in durable jewelry. Reflection and refraction of carefully placed detail added illusionary motion to some pieces, while others did in fact have kinetic elements. Boin's square bracelet with four diamonds affirmed the forementioned. Here molded and cast elbows connected tubes that served as carriers for sliding bezel-set diamonds, while concealed rubber pads deadened any metallic clatter. Threaded fasteners allowed for the addition of a sliding gem, as well as ease of repair, and brush-finished junctures concealed wear on vulnerable areas. These pieces were the result of comprehensive design and a sound knowledge of manufacture.

Angela Cummings's work is designed for and produced in limited numbers by Tiffany. "I try to design jewelry with the idea that it is eternally beautiful," she says. In this show botanical and marine forms of colored metals, gemstones and pearls projected that ageless quality. Luxurious by design and material, Cummings's work in some instances used nonprecious metals: a pendant of repetitive gray marcasite pads, one set with diamonds, a collar of various leaf forms using copper with

quantities of karat gold. This work was a rare application of nonprecious metals in moderate- to high-priced jewelry that sells successfully.



Whitney Boin, *Square Bracelet,* gold, diamonds

"P's and Q's," the collaborative work of Janet Prip and Robin Quigley, was fun and intelligent. These pieces addressed traditional details and concerns of the jeweler as well as concepts of the artist. Production items (some pieces number 1,000 units) of cast and tumble-polished polyester are available in an extensive palette and in numerous geometric and contemporary shapes, some encrusted with foils. This variety of color and shape could be applied by the wearer as a means of self styling or labeling: a "cult of identification" of marcasite stars or terrier pins. Some pieces had a Pop Art quality, where a button and buttonhole became a truly wearable button. Commercially available findings were remade in colorful plastic with puffy animated qualities. Attention to detail and humor were accomplishments for pieces retailing from $10 to $40.

William Bartholomew's jewelry is difficult to catalog. The pieces here ranged from reproductions of ancient jewelry to originals in refractory metals. His training as an art historian was evidenced in the pieces on display. Reproductions of Mayan, Egyptian and Victorian gold jewelry, they were sound likenesses of the originals and honestly presented as reproductions.

Gayle Saunders and Ivy Ross operate from a less traditional base. A similar concern for wearability and producibility, their works have evolved from a "studio" sense of design and manufacture. Saunders's work addresses each market: one of a kind, limited edition and production. In her analysis, the activity in one area enhances and encourages development in another. Economy is important, both that of the marketplace and the studio. Cut-offs and scrap from major pieces are successfully used in limited editions. Gold content is relative to the price range of a particular line. Production earrings shown here were simple: wedge shapes of bright silver with yellow gold patterns in relief; sterling castings with ear wire drawn from the casting by roll and hand forging. The *Ginko Leaf* earring, a popular example, has sold well. The more labor-intensive limited-edition earrings had many qualities of the one-offs. Simple and delicate wire frames clad with thin panels of sterling silver bore surface detail of colored alloys: a format for pieces that use some processes and materials of Eastern origin. A ring of light and open structure held a square wafer parallel to the hand. This horizontal composition read as a sample or trace of the activities from another piece. It is with this variety and flexibility that she ". . . ensures survival as an artist in the marketplace."

Ivy Ross's work, pins, cuffs and bead necklaces, is manufactured with a variety of materials: wood, mesh, gems and metals (predominately titanium). The success of the pieces was as varied as the pieces and materials themselves. *Woven Cuff,* a clip-on bracelet was an attractive and wise use of titanium. Anodized in a range of colors, it was simply woven into a cuff, much like a basket. The process used on this piece is congruous with the limited malleability and ductility of titanium. This and others of her pieces reaffirmed refractory metals as a look in the fashion industry.

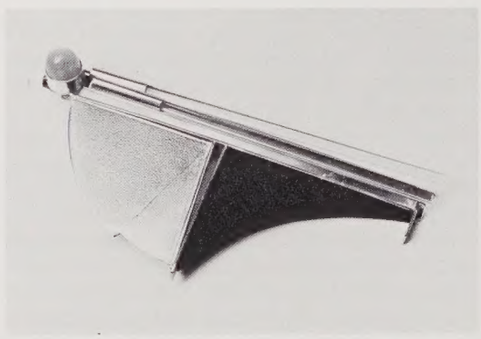
Grouped and displayed in well-made and refined storelike fixtures, the nature of display was appropriate for the pieces and their intended use.

Komelia Hongja Okim

Plum Gallery, Kensington, MD
April, 1982
by Gretchen Klunder Raber

Komelia Hongja Okim, *Terpsichore* pin, 14k gold, cat's eye, 1½ x 3½ x¾", 1981. Photo: Marianne Keffer

Komelia Hongja Okim annotates her daily thoughts by expressing them in the medium of her art, metal. She powerfully sketches her conflicts and tensions in the present work shown at Plum Gallery. The exhibit was the symbolic entrance to the coming year when Okim will teach and pursue scholarly research as a Fulbright Exchange recipient in Korea.



Komelia Hongja Okim, *Gingko Fan* pin/pendant, sterling silver, brass, copper, moonstone, zebrawood, plexirod, 1982. Photo: Marianne Keffer

In her Gallery Statement Okim stresses that she seeks to bring harmony to juxtaposed forms, textures and materials. This key unlocked the cohesiveness of the various elements of the show. Rich, passionate diversity of design expressed in color, texture and form reflected the personal concerns of Okim's background, rooted in Asian culture but formed in the United States.

Especially successful was her newest work where the sensory and the intellectual marry the cultural. Her pins *Square Fan* and *Ginko Fan* utilized textures interplaying with form in a refined yet visceral way. The square and circle created a controlled energy. Other pieces in the extensive and well-appointed show evidenced raw energy in a sensuous and flamboyant manner. Large ritual necklaces of wood, metal and gems contrasted with the lyrical silver planes of the brooches *Silver Horizon, Terpsichore* and *Silver Path.* In these works, Okim intellectualizes the landscapes of the mind both of man and nature.

Scrap Metal: New York City and Environs

by Antonia Schwed

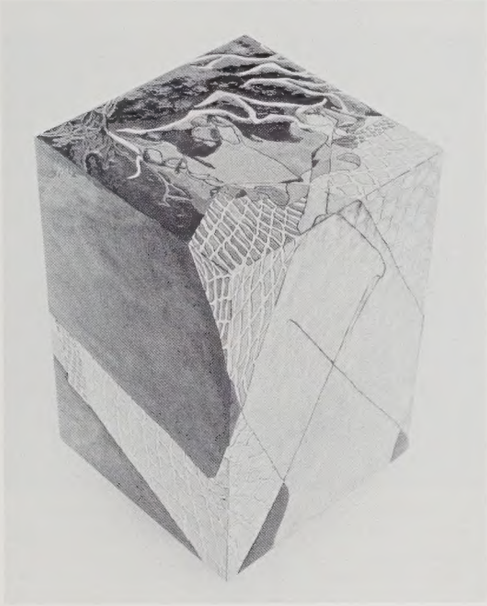
The WBAI December 1981 10th Anniversary Crafts Fair at Ferris Booth Hall, Columbia University, took up two floors and three weekends. It was, I thought, an excellent show, lively and varied. I have always felt that "cold enamel" were dirty words to the vitreous enamelist (except for certain repair work). But I was impressed with the work done by Mary Ellen O'Connor, who uses epoxy resins (cold enamel). She pierces out and saws her own delicate designs (no stamping) and solders them to the backing metal. Those she wants to duplicate she then has cast from her original. In other words, it is a champleve technique, for then she inlays with epoxies, blending and mixing these so that the colors are soft and subtle. Her work has none of the flat glare that I have previously seen in cold enamels and is very nice indeed.

Kathryn Regier Gough was definitely one of the stars of the show, with about 25 museum-quality pieces of cloisonne. Particularly effective were the enamel pieces combined with shaded porcelain beads. She orders these beads from a craftsman who specializes in them and then weds the two media, porcelain beads and cloisonne centerpiece, to make a beautiful unity. She also showed me some exquisite silk scarfs she had painted—a new medium for her, though I hope nothing takes her basically away from her beautiful cloisonne. Of course, I certainly sympathize with a desire to take a break from enameling. It's easy to suffer burnout from the craft, since top-rate work—particularly jewelry—is fiercely demanding.

On the subject of cloisonne, there was a considerable amount of it, both attractive and competent at the Fair. As I wandered around to the pervasive sound of the African slit drums, I noted nice cloisonne jewelry by Rosanne Risner (all in cast settings), but outstanding was a small gem of a cloisonne vase she had done. There was also good small cloisonne done by Jacqueline De Boer, grisaille work by D.X. Ross, interesting metalwork by The Danforth Pewterers of Vermont, quite a bit of attractive oxidized brass work, blown glass, ceramics, leather, wood, textiles and so on. All in all, a rousing good show. I look forward to the one in 1982.

In March, Marit Guinness Aschan, the English artist-enamelist, had an interesting exhibit at the Bodley Gallery in New York. It was primarily staged as an art show, with enamel as Aschan's medium. But as enamel tends to be so domineering, it couldn't help but turn out to be an enamel show, too. Her highly personal work consisted of large, abstract enamel pictures and sculptural pieces, some of the latter incorporating their own lighting. Aschan piles on many layers of enamel with much overfiring and warping of the background metal as part of the whole, and the

result frequently is a colorful, seething abstract. She utilizes firescale, embeds foil-wrapped lumps of enamel and in one picture even worked in slivers of mica. She enamels over masses of wire and wire mesh and it's all highly tactile, brilliant and bubbling with energy. Some of it worked very well but, for me, other pieces did not. I often was disturbed by the warpage, which usually resulted in a dishing effect, and some of the work just seemed a little overwhelming. I also wish Aschan would be more meticulous about the mountings as seen from the side—her work deserves better. But the pieces I thought really worked, with their right combination of color and dynamic energy and techniques, were truly handsome and overall I did admire her exhibits.



Doretta Balk Sherwin, *The Promise of a Touch*, Limoges enamel, plating and patining on copper, pedestal, 11¾ x 11¾ x 20"

I cannot think of any work more in contrast to the above than that of Belle and Roger Kuhn, shown in April at the New York branch of The Elements gallery. Their work is elegant, disciplined, painstaking and small. Belle is the enamelist, Roger is the setter, the jeweler. His settings and backgrounds for Belle's work seem perfect—cool, fluid, supportive with no baroque distractions. Belle's enamels are fascinating. She gets her inspiration from moth wings seen under a microscope. In her own words: "A background layer of opaque enamel established the underlying color pattern of the piece. Over this I laid textured strips and bits of silver foil fashioned by passing thin sheets of silver and fine mesh screening together through a rolling mill and breaking apart the embossed foil that resulted. Layers of transparent enamels followed, modifying the underlying colors and creating the final values and hues." There were about 28 pieces in this exhibit, showing subtle variety of design and color. All had a soft sandpapered finish. One textured design almost looked like reptile scales, another like peacock feathers. Beautiful work, relaxing and delightful to the eye.

A brief stop at the new Heller Gallery at 71 Greene Street in SoHo revealed a large classic space, the walls hung with the work of Erwin Eisch. Dramatic glass sculptures also by Eisch were displayed in the center space and then, in a further back section, some fascinating work by Sydney Cash. This consisted of four dripping glass sculptures in glass wall boxes and four wall constructions, close to collages but definitely more thrustingly three-dimensional. It was exciting to learn that new and different work by Robert Ebendorf will be coming in May, and then in June, Andre David's large metalworks, combining painted steel with aluminum and bronze.

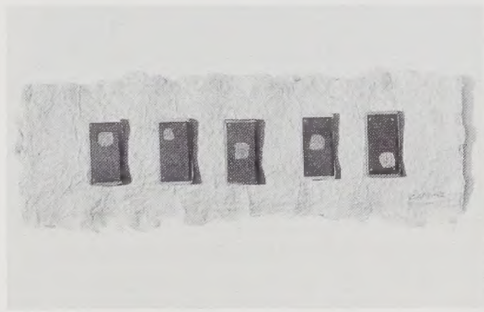
Finally, on to the Spring Street Enamels gallery to see the much heralded work of Doretta Balk Sherwin. There were 14 pieces in all in the show: wall hangings, large boxes, pedestals, coffee tables, all of them covered with Sherwin's elaborate mosaic, jigsaw-puzzle designs. Some of the jigsaw pieces were as small as ¼" diameter. Where sections are not enameled they are either very beautifully patinated, gold or silver plated. The enameled sections form the bulk of the designs and are done, as far as I could detect, all in transparent, sometimes cloudy, enamels, seeming to make no use of opaques, which I felt was a great loss. The standing cubes, which are called pedestals, are, I suppose, what is termed "sculpture." But not even a pedestal set with a sort of rectangular lollipop would be what I call sculpture. Sherwin's drawing is smooth, adept and, as the press release noted, suggests Gustav Klimt. The designs involved large figures set against rich, leafy-form backgrounds. The mosaic coverings of the wood pedestals and boxes and tables were skillfully and beautifully fitted together. Sherwin's work is truly a tour-de-force. It would be good to know who does the woodwork so essential to Sherwin's work; I saw several studio pictures of Sherwin with two assistants, neither of whom was identified. A whisper of credit to these elves behind the scenes would have been appropriate. The show, as every one at the Spring Street Enamels Gallery seems to be, was beautifully arranged and lit.

If the reader detects a slighty testy note in the above review, I'll confess that I was a bit depressed by the slick PR for this show. I know in 1887 W.S. Gilbert wrote that if you wished in the world to advance "you must stir it and stump it and blow your own trumpet or trust me you haven't a chance," and I know that is more true than ever today. Yet, somehow, the concept of saddling up Ole Paint to ride down the Blazing Ego Trail to the Greatest Show on Earth turns me off. It makes me uneasy as I think about all the unsigned beautiful works of art in museums and the talent that may today be lost in obscurity because of lack of "the wherewithall" and "knowhow," or simply because of the artist's shyness or reclusiveness.

James B. Evans
Prime Canadian Crafts, Toronto, Canada
April 1982
by Jennifer Place

James Evans makes jewelry that commands attention . . . it is whispered around town that he is one of the new metalsmiths to watch, and his first major Toronto exhibition underlined the rumor. The work was innovative and striking; one did come away from the show feeling that something new had been experienced.

The 30 new pieces shown at Prime were divided roughly into four areas of concern: geometric and minimally linear brooches, small sculptural forms, brooches using non-traditional materials and methods and pieces incorporating tiny figures. The linear pieces were formed from 14k gold and silver tubing shaped in soft angles, but with one corner holding a cubic zirconia. The sculptures were perhaps the most evocative pieces, as much larger worlds were held in tiny frameworks. Pieces of slate found on the side of the road in Halifax were bound with wire, hung like small totemic objects and graced with drawing. A dozen or so stickpins were wrapped with gauze and then with dark thread and unceremoniously stuck in a tray of moss and grass. It was impossible not to rearrange the pins in the moss, or to see what it was like to wear a pin made from such humble materials. Small brass supports held a rod from which seven small pieces of metal in varying shades of gray were suspended. Made of sterling, nickel silver, titanium, stainless steel and aluminum, they could be rearranged on the rod to create different colorations.



James B. Evans, *We can't leave the hapazard to chance*, series of five brooches, mild steel, 24k gold, 14k gold rivets, sterling silver; mounted on handmade paper by Leslie Sampson. Photo: Judith Hanes

The group of brooches using alternate materials were fascinating not because of their use of titanium or niobium, but more due to the restraint placed on these materials. Colors were all dull greens or grays rather than the riot of color usually found. Generally the metal was of simple, squarish shapes riveted to a slightly larger base of silver. Decoration was in the form of tiny holes that sometimes held a minute diamond, sometimes allowed the silver to shine through, were torched to give a dark, smoky color to various areas, or were seen through cloth or Damascene inlay, where 24k gold was chisled into crosshatched steel.

Another group of pieces featured small black figures, usually with suitcases, either emerging or going into the metal. The figures were zinc painted with black enamel. The pins were made of a variety of materials: silver, brass, patinated copper, stainless steel, and were decorated with graffiti and marks, which Evans feels are evocative of modern man's alienation and fear.

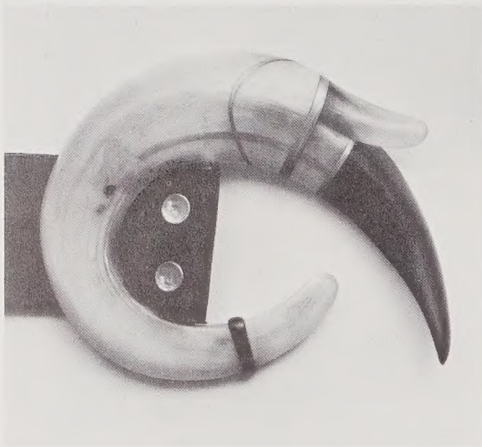
James Evans, born in Kingston, Ontario, studied at George Brown College in Toronto, then moved to the Nova Scotia College of Art and Design in Halifax to study under metalsmith Christian Gaudernack. He is also involved in theater and in writing, and has been actively employed in both areas. Exhibits of his work include a variety of juried shows in Toronto and in Halifax, such as *The Medium is Metal,* the 1981 Metal Arts Guild juried show, where Evans won the Design Award for Innovation. His work was also recently included in the 1982 *Objets des Metaux Precieux* in Montreal, and in a show at Nova Scotia College that Evans likes to call *Metal Illness.* He is currently an Assistant Instructor of jewelry in the Nova Scotia College Department of Extensions, although plans to

return to Toronto to more firmly establish as a metalsmith are a priority.

"Spatial considerations: in a world overcrowded with objects my entire oeuvre can be transported in the pockets of my jacket." It will be very interesting to see what James Evans does next.

EOMMEX Jewelry Show

Athens, Greece
February, 1982
by Anne Barros



George Polyzos, *Belt Buckle*, bone, horn, sterling silver, 9 x 12 cm

The Hellenic Organization of Small and Medium Size Industries and Handicrafts (EOMMEX) held its first juried show of jewelry in Athens this year. About 90 jewelers, craftsmen and jewelry designers from all over Greece participated. The jurors—two painters, a sculptor and a jeweler—under the direction of Mr. B. Papandreou, President of EOMMEX, gave awards in three categories.

Among the award-winning pieces was a sterling silver brooch by Kleareti Kazazi of Salonika that was beautifully pierced and folded to suggest the forces of nature. Working in black-and-white bone and horn with silver inlay, George Polyzos from Serres made a sleek presentation of a belt buckle, bracelet and two torques that were so smooth you could feel them settling comfortably around your neck. Perhaps the most provocative of the entries were those of Athenian Stella Frankaki, who playfully jibed at traditional folk jewelery by hanging from her neckpieces old clock faces and found votive plaques of repoussed eyes and hands.

An unusual feature of the show was the submission of renderings as a separate category. The quality ranged from excellent (Daradimou Karaleka's award-winning entry) to poor, but it was certainly interesting to see the variety of techniques employed. They ranged from gilt paint on shiny black board to surrealistic blue and yellow watercolor on white card.

It would be easy to criticize the work shown as being often imitative, unadventuresome and poorly executed. I would rather give kudos (a good Greek work) to the participating metalsmiths, who are usually working by themselves in distant parts of Greece, often without much training and with little monetary reward or appreciation for contemporary design in jewelry. I feel that EOMMEX deserves praise for offering Greek jewelers and craftsmen this first opportunity to present their work. Unlike the Olympic games, may it be a yearly event.

The Maker's Eye

Crafts Council, Waterloo Place, London
January 13–March 28, 1982
by Barbara Young

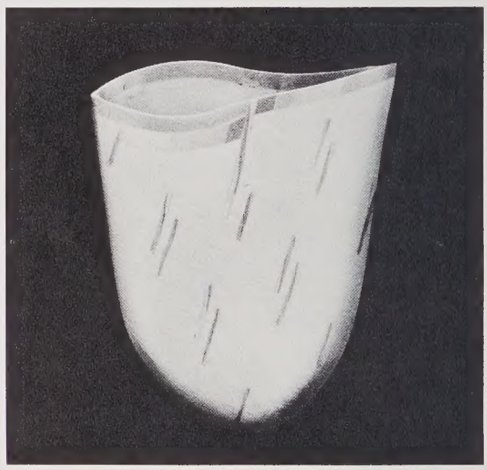
"The Maker's Eye," a composite show of British crafts, marked the opening of the newly extended premises of the Crafts Council at Waterloo Place. The new gallery gives the Council three times its former exhibition space, more space for the information service, a home for the collection, a coffee bar and lecture room, all of which is refreshing news for these spartan times. A mixed media, rather than a single-category show, was mounted to inaugurate this opening, with the thought to awaken interest and inform the public generally of craft activities, seen as a sort of crash course on recent trends (though a few examples trail back to the late 19th century). A group of 14 selectors, all of whom are active craftsmen at different stages of their careers, coordinated their selections over several months. The resulting exhibition embraced a wide spectrum of media and demonstrated a range of skills.

The exhibition included artifacts of superb quality in the expected categories of furniture, ceramics, metalwork, textiles, basketry and woodwork and such surprises as a Bonneville Triumph motorcycle (much of which is, after-all, built by hand), an Eileen Gray table (1927, reproduction), a harvest loaf, saddle, a jelly mold necklace and a papier-mâché mask. These latter two items, as well as some other unfortunate choices, clearly should have stayed tucked away in the storeroom. It is not the liberal breadth of choice—this was marvelous and challenged anew one's own concept of craft—but rather the range of quality which required nothing short of a parental indulgence. Some of the items were quite simply pure junk.

Malcolm Appleby *Head of Hair* bowl, 18k gold, 5 cm d, 1979. Bowl raised by Peter Musgrove. Photo: Ian Dobbie; courtesy the Crafts Council

The category of metalwork and jewelery, the main concern of this review, reflected this same sharp up-and-down pattern, carrying no coherent message. The pride of place among the metalwork entries went easily to Malcolm Appleby, unquestionably Britain's finest engraver. According to Appleby, the gold bowl "head of hair" was realized one day when he asked his cleaning lady to pose for him in order to capture the real qualities of a casual head of hair. Over the finely contoured locks one finds wisps of stray hairs, single floating lines, which he observed are always there no matter what. A more recent work of his is a twisted torque of Stubbs silver steel blackened and inlaid with a light touch of gold. His third piece was the engraved metal mounts on a 12-bore side-lock ejector shotgun. Appleby has engraved numerous such gun mounts, sometimes with images of flying birds, blued and iridescent, in meticulously detailed feather patterns. These bird images are endowed with such grace and feeling that they appear three dimensional when held at arm's length.

Another fine entry was Ros Conway's group of three container brooches made of colored golds and silver. Sensitive and witty forms, they seemed typically British, if one dares to generalize, coupling fine craftsmanship with conceptual restraint. The container form, both box and bowl, have been a central theme in Michael Rowe's recent work. One red brass bowl was reminiscent of the light-dark, solid-void values of sculpture of the 20s. A more successful example was a bowl form of silver with a fine edge of copper set flush with the surface, truly a progressive form.



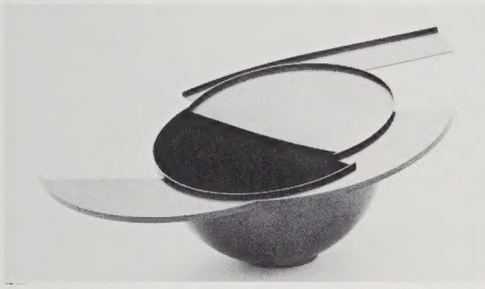
Ros Conway, *Container Brooch*, colored golds and silver, 3.5 cm h, 1978. Photo: Ian Dobbie; courtesy the Crafts Council

Overall the jewelery category was comprised of a puzzling collection of items which presented anything but a picture of vitality and decisive innovation. The sincere work of the older generation, Charlotte de Syllas and Gerda Flöckinger, still carries its own weight in terms of quality, even though their style is no longer *à la mode*. But why was the public treated to this number of bangles (the hoop bracelet) made of wood, dyed perspex, polyester resin and nylon tufts, a pair of earrings composed of a nickel-sized wafer disc of silver with a small square subtracted from the center, wire bent into a square called a "necklet," a rod of annodized aluminum terminating in an awkward twist called a hair pin? This is not understatement; this is nothing.

Since well-crafted and well-designed work can be found without searching too diligently in polytechnic degree shows, one is forced to wonder how such trifles, masquerading as jewelery, came to fill the cases of the Craft Council's gallery. It seems doubtful that their objective of awakening interest and informing the public of the crafting activity in this particular category is going to have the desired effect, though it may be hoped it could work in reverse.

In summary it can be observed that Britain maintains a standard of excellence in the fields of ceramics, printing and graphics, and in woodworking generally, whether in producing exquisite bowls, boxes or musical instruments. In these media there is confidence demonstrated, patience, intuition and, yes, love. Relative to metalsmithing, no such claims could be made, if one is to take the selections in this exhibition seriously. But there

is fine metalwork and fine jewelry crafted in Britain—it just didn't get into this show. The real loss is felt for the young aspiring jewelers and smiths who look to the Crafts Council, understandably, with innocent eyes and with a proper willingness to be lead. The question of which path to pursue and what standards to uphold is not answered by an exhibition of metalwork with such a lamentable lack of quality control and lack of determined philosophic stance.



Michael Rowe, *Bowl*, red brass, patinated dark brown, 15 x 14 cm, 1981. Photo: Ian Dobbie; courtesy the Crafts Council

Medieval Limoges
Medieval Gallery, British Museum, London
October 29, 1981–January 30, 1982
by Barbara Young

Statuette, the Archangel Gabriel from an Annunciation, brass, 16.8 cm h. Picardy, Artois or southern Flanders, about 1260-70. Photo: courtesy the British Museum

This exhibition was composed of some 50 objects from a larger collection of medieval enamels known as the Keir Collection. The selection of objects shown was made on the basis of their historical interest, artistic quality or both. The main body of this collection was purchased in 1971 by its present owner from Ernst and Martha Kofler-Truniger of Lucerne, who had formed their collection between the early 1950s and mid-60s. To this remarkable collection, composed of 156 pieces, the present owner has added some 20 pieces.

The collection can be counted among the half dozen most important in the field of medieval Limoges. The exhibition included examples of fine enamels from other regions (e.g., Catalonia, Mosan and Upper Rhenish) of various periods and in a variety of techniques exhibited in a parallel showcase. This material, which stood in contrast to the main theme, the development of medieval Limoges enamels, was most instructive to interested viewers, even those with limited background knowledge. In addition, the viewer could consult cases from the permanent collection in the same gallery which explained the methods used in producing various kinds of enamels through drawings, text and actual pieces of work. If one used the catalog prepared for the exhibition by curator Neil Stratford, while viewing the Keir Collection, one could readily come to appreciate something of the medieval Limoges enameler's art. All in all the exhibition was prepared in the best educational tradition. This was truly a fine achievement on Mr. Stratford's part, since medieval enamels are not readily appreciated. For instance, at first glance it appears that both technique and subject matter were long-standing traditions that barely changed over several hundred years, and this is hardly the case.

The question of the origin of Limoges enamels has vexed collectors and scholars since the late 18th century when medieval enamels, mainly in the form of liturgical vessels and reliquaries, began to pass from church treasuries into museum collections. (That the Kofler Collection could be formed, not through block purchase, but one by one at auctions and sales, from the 1950s into the mid-60s, and the Keir Collection formed post-1971, is indeed remarkable.)

The term *oeuvre de Limoges* has become accepted to cover a number of possibilities and apply either to the place of manufacture, to the place where the artists were trained, to the style and techniques they employed, to the place from which the enamels were exported or even, finally, to the place where the colored glasses used in the enameling process were produced. In compiling the catalog of some 10,000 surviving pieces, the French authority Marie-Madeleine Gauthier has preferred to employ a phrase which could be seen to take account of all these possibilities: *Corpus des émaux méridionaux* (the body of southern enamels). This title is sufficiently broad to embrace transfers and trade in these objects, in the raw materials, circulation of models and travel of craftsmen, all taking place from 1100 to 1350 AD.

One of Ten Plaques from the base of an "ymage" of the Virgin and Child—a prophet or patriarch, champlevé enamel on copper, 5.7 cm h, 7.9 cm w (top), 11.4 cm w (bottom). Cut in technique reminiscent of silver basse-taille. Southern Germany, region of Lake Constance, about 1340. Photo: courtesy the British Museum

In the exhibition the five showcases were arranged to illustrate the stylistic and technical evolution of Limoges, which could also be studied at leisure in the catalog itself. The amount of color and color combinations are characteristic features of different periods, workshops and even individual artists. Madame Gauthier suggests that one can describe the use of color employing terms from the language of music. Several colors fired form a "scale." Blue can be considered the "dominant" when edged with white, or green when edged with yellow, while accents of red or black are "tonic." Variations can be a measure of performance, either virtuosity or at times simply a mistake, or, signaling a change in taste. The other two controlling colors are the background blues and the gilding of reserved areas. The distribution of these factors yields the individual character and establishes the balance and harmony within each object.

Rectangular Plaque, two censing angels, champlevé enamel on copper, 10.9 x 22 cm. Limoges, about 1185-90. Photo: courtesy the British Museum

In the showcase of other types of medieval enamels there were examples of gold and copper cloisonné and Mosan copper champlevé enamels. Material from the 14th century was represented by champlevé enamels from Catalonia, Italy and the Upper Rhineland.

Gable-shaped Plaque, two martyr saints, champlevé enamel on copper, 24.4 x 18.2 cm. Perhaps from a *châsse* (reliquary). Limoges, about 1200-1210. Photo: courtesy the British Museum

For additional study on this subject, the catalog for the exhibition includes an excellent bibliography: *Medieval Enamels* by Marie-Madeleine Gauthier and Geneviève François, edited and translated by Neil Stratford of the British Museum staff, British Museum Publications, 1981. (Available in hardback only from the Museum Bookshop, £8.95, plus shipping.)

Metals for the Metalsmith

Powder Metallurgy

by Aggie K. Beynon

Powder metallurgy, as developed in my experiments, is the process of consolidating and compacting fine metal powders into solid objects. During my experiments I concentrated on the feasibility of P/M (powder metallurgy) as an art form. My research restricted itself to the conventional method of P/M processing. Common commercial variations may include a variety of compacting methods as well as additional sintering steps, depending on the desired finished product. My research departed from conventional P/M in that I created commercially undesirable mixtures. This was possible because strength was not a dictating factor as it is in industry. Of prime concern was the potential for creating variegated colors and textures in metal through a fairly simple process without the multistep operation of alloying and fabrication.

Because the theoretical range and complexity of problems worked on by industrial powder metallurgists is now so advanced, it was important for me to take an empirical approach in developing my own particular process. Using metals with dissimilar properties through this process was truly pioneering unchartered grounds, because, unlike commercial P/M which deals principally with homogeneous compacts, my compacts were heterogeneous and theoretically unsuited for permanent bonding or were uninteresting commercially.

In order to discuss my procedure I feel some definitions are necessary. (I have relied on Joel S. Hirschhorn, *Introduction to Powder Metallurgy*, New York: The Colonial Press Inc., 1969.) *Milling:* a mechanical process using a high speed burr to shave off very fine chips or particles from a solid piece of metal (collected and used as powder). *Dendrites:* electrolytically deposited metal crystals (used instead of commercial powder). *Green compacts:* the compressed powder or loose powder before sintering. *Sintering:* the process by which an assembly of particles, compacted under pressure or simply confined in a container, physically bond themselves into a coherent body under the influence of heat.

Materials

The large number of experiments I made necessitated the use of inexpensive raw materials: principally, pure copper, 100-mesh reduced oxide powder, monel (70% nickel, 30% copper), prealloyed atomized 100-mesh powder, and dendritic silver. A wide variety of other materials were added for texture and color, such as nickel shot, brass filings, bronze screening, brass and silver tubing and silver and gold wire. Also employed during several experiments were 14K milled gold and atomized 8K gold powder. To date the gold powders have been barely satisfactory. In the case of the milled gold the particles were simply too large, in comparison to the other materials, which resulted in much shrinking during sintering, while in the case of the commercial atomized gold the powder was probably too large a mesh and it refused to bond, except when locked in place by the adjacent metal.

Oxides not reduced out during sintering can weaken the bond between the metal particles and cause premature cracks when the finished compact is being cold worked. To avoid oxidation of the raw powder and other impurities the powder was kept in a closed container between uses. The normal voids in powdered metal compacts permit air to enter and accelerate oxidation upon heating.

Compression and Sintering

It was my fortune to work in the metallurgical laboratory of the Mechanical Engineering department at the University of Kansas for the duration of this research, which made available the necessary equipment. The process began by filling a lubricated circular hard-steel die cavity (Figure 1) with approximately 35 grams of various powdered metals in layers, which formed colored stratum in cross section (Figure 2). The powder was tamped down to eliminate air pockets and then compressed at 40,000 to 50,000K (pounds pressure) psi (per square inch) to consolidate it into a green compact strong enough to handle until sintering (Figure 3). The bond in the green compact is not strong and in most cases if the compact is dropped at this time it will break.

Although the mechanical press used was capable of 50,000K, experiments were conducted to see the effect of different pressures on the density of the green compact. At first I thought that the greater the density the greater the strength, but after working with different specimens it was apparent that the properties of densification were more complex. Probably the main disadvantage of high pressure is the lower porosity which makes chemical reduction slower during sintering. High pressures also increase die wear. Densification of 30K to 40K psi had good properties for my purposes at this stage of the research.

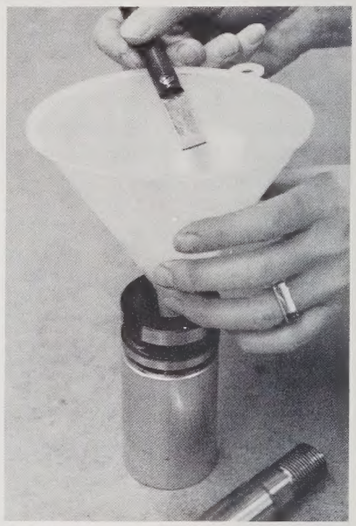
Ejection of the green compact from the die cavity was followed by sintering in a reducing atmosphere furnace. The furnace was purged of oxygen by flowing nitrogen through the sealed chamber for approximately five minutes. Depending on the lowest melting temperature of the metals in the compact, the furnace was set at either 732°C for silver-monel mixture or 816°C for copper-monel mixture. Hydrogen was introduced into the chamber when the atmosphere was oxygen free (approximately five minutes after nitrogen starts), and the nitrogen was turned off. An explosion might occur if the hydrogen were introduced into a heated oxygen atmosphere. The furnace was allowed to come up to temperature and stay there for approximately 30 minutes; then it was turned off. In some instances, a longer time at maximum temperature is advantageous. The hydrogen was kept on until the furnace cooled a bit; otherwise the compacts would oxidize.

The sintered material formed a metallurgical bond and became a solid with similar strength to castings. Unlike casting, however, the sintering took place at a temperature below the melting point of the material. Depending on my design plans, the sintered compact was milled, rolled or cut. During this stage problems in the process became apparent. For instance, the circular compact would crack along the edges, or, due to the uneven distribution of stress, when put through the rolling mill it would crack along stress lines. To solve this problem at first the circular compact was cut into rectangles before further compression. Later a different, rectangular die was used that held only 20 grams of powder instead of the larger capacity round die.

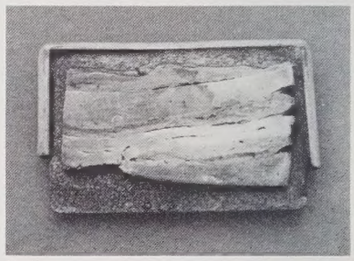
It took many experiments to work out a more serious problem: the breakdown in the bond between the dissimilar layers of metal. Basically this problem occurred because of the different mechanical properties of the various metals. Throughout most of my experiments I used metals with dissimilar properties for expense and design reasons. For instance, I used silver with monel and copper because it was fairly inexpensive and the contrasting colors were exciting (Figure 4). The difference in melting point of silver and monel is great, as is the difference in ductility. Because the melting point of silver is lower than monel, a lower temperature had to be used during the sintering. Otherwise the silver would alloy with the monel and form a homogeneous color. Thus a good metallurgical bond never occurred in the monel, and cold working of the finished compact was limited. An even greater problem existed if the components formed a low-melting mixture (eutectic).

Fabrication

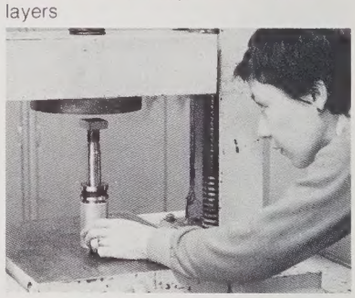
For soldering the finished compact has properties similar to any sheet metal. The only factor for concern is overheating, which will cause alloying of the lower-melting metals to adjacent metals. Because of the porosity of this material, the metal



1. Filling the steel die with powdered metals



2. Cross section of powdered metal layers



3. Compressing the layers

4. Silver with monel and copper ring by the author

heats up much faster than regular sheet metal.

Polishing surface presents no problems unless porosity is high. Then the softer metals will wear away before the harder ones, leaving an uneven surface. Work hardening the surface before the polishing alleviates this problem.

Conclusions

In early experiments I was able to create a P/M compact of dissimilar metals which was usable in some designs. The reason for this success was that the bond created was strong as long as it required no further cold working. Because this is limiting designwise, the major focus of my research became and is still the workability of the sintered compact. Over the course of the research the working properties have improved a great deal. For instance, I am now able to roll the copper/silver/gold compact to more than double its post-sintered length. Even the stubborn copper/monel has improved workability.

The potential for creating texture and color without the complications of fusion is exciting—recently I have been working with powdered titanium and stainless steel—and I hope this initial research will generate some interest for future experimentation.

The opportunity to research a commercial process for art's sake satisfies an important function: the acquisition of new knowledge and the cross fertilization of ideas which allows a greater understanding on both sides of the art/technology fence.

Source of Supplies

Atomized gold: Connecticut Engineering Associates Corp., Philo Curtis Rd., Newtown, CT 06482
Steel, copper, bronze, brass: Consolidated Astronautics Div., 230 Marcus Blvd., Hauppauge, NY 11787
Titanium (samples): RMI Company, 1000 Warren Avenue, Niles, OH 44446

Acknowledgments

I would like to express my gratitude to those who have supported me during this research. Without their insight and hard work, powdered metallurgy in metalsmithing would still be just an idea; Professor Ken Rose, Professor Gary Nemchock, The Nunemaker Undergraduate Research Committee.

Aggie K. Beynon is a recent graduate in metalsmithing from the University of Kansas. She is currently an independent metalsmith.

Questions & Answers
by Linda Weiss-Edwards

Submit questions for this column to Linda Weiss-Edwards, P.O. Box 1032, Sausalito, CA 94966.

Where are acceptable limits, where does concern for safety cease to be reasonable and become obstructive and uneconomic?

There cannot be a general answer to a question of this nature; we must all answer it for ourselves. What is the value of health and well being? It is easy to avoid this question when we are young, single and perhaps enjoying the role of starving artist. But, if we choose to share our lives, and/or project them as long, healthy and happy, then the economics of it has little relevance. Like all manufacturing businesses, artists-craftsmen need to make their product cost effective. Your pricing system should figure "overhead" to cover the operation of your business, e.g., in our studio a few of the expenses covered under overhead are: Health and Business Insurance, Bookkeeper and Accountant, Small Tools and Supplies Repair and Maintenance, Security System, Travel and Education, Dues and Subscriptions, Office Expenses, Rent and Utilities. The business supports all of that, plus our personal expenses (which are not part of the overhead). If we need new health and safety equipment, we treat it like all other business necessities. We buy face masks, gloves and earplugs when we run out just as readily as we buy buffs, sandpaper, files and hammers.

In setting up the studio, if we get a device to heat up the pickle, we arrange for a means to exhaust it, etc. We choose to be concerned about our health as part of the total concept. Others may not find that appropriate. It may not be convenient, but I don't see the issue as being the price of the safety device, I see it as being the requirement to remain healthy and happy.

Are asbestos gloves safe to use?

The *Art Hazards News* (January, 1982, vol. 5, no. 1) reports as follows: A recent study entitled "Occupational exposure to asbestos fibers resulting from use of asbestos gloves" suggested that the use of asbestos gloves results in exposure to potentially hazardous levels of asbestos fibers. The study was carried out by Drs. Behzad Samimi and Anna Williams of the University of Wisconsin-Parkside (*Am. Ind. Hyg. Assoc.* J.42, 870 (1981)).

The authors showed high asbestos exposures from the use of asbestos gloves. They tested ten pairs of asbestos gloves—eight in daily use and two new pairs—under both simulated conditions and conditions of normal use. The results, for example, showed that the time-weighted average concentration of asbestos fibers in the breathing zones of workers using asbestos gloves varied from 0.07 to 2.93 fibers/cubic centimeter; five of the seven breathing zone samples exceeded the NIOSH-OSHA Asbestos Work Group recommendation of 0.1 fibers/cubic centimeter and one sample exceeded the current OSHA standard of 2 fibers/cubic centimeter. Old and worn gloves released the most fibers but new gloves also released substantial amount of asbestos fibers. Soiled gloves released fewer fibers than clean gloves.

The authors also found that handling the asbestos gloves resulted in contamination of hands by asbestos fibers, and expressed concern about possible risks from accidential ingestion of the asbestos fibers.

The study concluded that asbestos gloves represent a potential hazard and recommended the use of nonasbestos gloves.

Note: Recommended substitutes for asbestos are: ZETEX, a silica-based product said to withstand up to 593°C (1099°F) and NOMEX—nylon—for heat up to 250°C (482°F).

What is the most effective method of cleaning up spilled solvents or acids?

Art Hazards News (November, 1981, vol. 4, no. 11) advises: Spills of hazardous liquids such as acids, alkalis, solvents, plastics resins, etc. need quick clean-up action to prevent the spread or evaporation of the liquid. Use of gloves, respirators and protective clothing might be needed for some materials.

One of the common methods of cleaning up liquid spills is to simply soak up the liquid with paper towels or a similar material. Unfortunately, this is often creating more of a problem since the soaked paper towels can provide a large surface area for volatile liquids to more easily evaporate. If the liquid is flammable, you have created a fire hazard. This is especially true when the soaked paper towels are simply thrown into open waste paper baskets.

Another common technique for cleaning up acid and alkali spills is neutralization. For example, acids such as nitric acid, sulfuric acid, acetic acid and hydrochloric acid can be neutralized by the addition of sodium bicarbonate powder. Alkalis such as caustic soda, sodium hydroxide, ammonia, and photographic developer solutions can be neutralized with citric acid or dilute acetic acid. Neutralization however has the disadvantage that clean-up afterwards can be messy and time-consuming.

Requirements or an effective spill control material include effectiveness against many different types of spills, rapid action to prevent evaporation, high efficiency so that large amounts of spill control material is not needed, retention of the liquid so that it does not simply evaporate from the spill control material, and easy clean-up and disposal.

Materials with most of the above advantages include diatomaceous earth, vermiculite, activated charcoal, clay, kitty litter and amorphous silicate. These materials are effective against most liquid spills (with the exception of hydrofluoric acid), with diatomaceous earth and amorphous silicate being most effective.

The introduction of spill control pillows makes the spill clean-up job even easier. These pillows contain amorphous silicates and come in different sizes. They are easy to handle, absorb liquids quickly and retain them efficiently, and are easy to dispose of in waste disposal bags. The hazardous liquid absorbed on the spill control pillows can then be evaporated in a safe location (e.g. exhaust hood), eluted, incinerated or even disposed of in most instances in most land fills. One supplier of these spill control pillows (and of hazardous waste disposal bags) is Lab Safety Supply Co., P.O. Box 1368, Janesville, WI 53545.

Book Reviews

Gems Made by Man by Dr. Kurt Nassau, Chilton, Radnor, PA, 1980. 364 pages, 248 illustrations, 34 in full color, 6¼ x 9½, $28.50, cloth

This is a serious, complete and competent discussion of the field of synthetic gem materials, their history, methods of growth and causes of their color. It is well written, well illustrated and, very important for a field in which the literature is so scattered, well referenced. It is written for the "intelligent layman" and presumes no previous background in the physical sciences, although at least high school physics and chemistry would be helpful. The subject matter of each chapter is arranged so that the technical details are relegated to a concluding section of each chapter marked "Technical Data." This arrangement enables the average person to read the main part of each chapter and skip the technical data, unless he is especially interested in the nitty-gritty details of the growth process of a particular gem.

Dr. Nassau, having more than 200 professional papers to his credit, is one of the world's best known researchers in the field of synthetic gem growth and the causes and manipulation of gemstone colors. he also is in love with gem crystals, considers himself a hobbiest as well as a professional and has written extensively for gemological journals and for hobby magazines.

Nassau's writing style is clear, concise and lively. The book is well made and virtually free of errors and misprints. The illustrations are well designed and clear. One wonders, however, if the color plates really serve a useful purpose in a book like this except to raise the price. The numerous black and white photographs are very good and are well chosen.

All in all, the book is rather easy and enjoyable reading considering the technical nature of the subject matter. This is in part due to Nassau's longtime interest in the historical origins of the synthesis of gem materials and the "human" side of synthetic gems. He has published extensively on this subject and much of the material presented here is the result of his original research. The jeweler/craftsman who uses synthetic gem materials will find the historical information of great value in enhancing his own, and the public's, appreciation of some of the exotic modern synthetic gem materials which are now available. The real meat of the book, however, is the careful description of the various processes by which synthetic gem materials are grown. An appreciation of the different processes is helpful to the craftsman in understanding the strengths and limits of each synthetic gem material.

The book is divided into 26 chapters, grouped into eight sections. The first section is two brief, but well written introductory chapters about the nature of gemstones and their synthesis. Anyone with any experience with gemstones can skip these chapters.

Section Two contains eight chapters, all pertaining to ruby and sapphire growth. This section will probably be of the most interest to the average jewelry/craftsman. Here Nassau describes in detail the history and technology of Verneuil furnace growth, the method that produces the vast majority of the inexpensive, varicolored synthetic gemstones. These constitute the vast bulk of the cheap synthetics used in production jewelry, such as class rings, "birthstone" jewelry and so on. It is very important to understand the age of this process and why its product is so cheap and durable compared to some of the synthetics described later in the book.

Section Three has two chapters on the varieties of synthetic quartz. In view of the recent rash of Russian and Japanese synthetic amethyst offered as natural in Brazil and other primary gem centers, this section is quite timely.

Section Four is titled "Emerald and other Beryls," but is essentially about the long history of the attempts to synthesize emerald. The destinction between flux-melt and hydrothermally grown (including natural) emerald is a very important one for the working jeweler, because of the differences in their reaction to heat.

Section Five consists of three chapters about the synthesis of diamond. Although synthetic diamond is very important in diamond tools, these chapters have little of interest to the craftsman since synthetic gem diamonds are only a laboratory curiosity.

Section Six discusses various synthetic materials used as diamond simulants, so it will be of great interest to anyone involved with consumer jewelry. This chapter describes the nature and growth methods for the various diamond simulants which have become so important in recent years, including Y.A.G., G.G.G. and, of course, cubic zirconia.

Section Seven covers all of the other synthetic gem materials, including garnets, turquoise, opal, lapis lazuli, etc., and concludes with a chapter (24) that every jeweler will want to study very closely. It is a detailed description of the methods by which the color and other characteristics of a gemstone are altered and enhanced. Anyone who uses gemstones will get the value of the book from this chapter.

Section Eight is two long chapters, one a rather technical, but interesting one about the techniques of crystal growth. This chapter will enable the craftsman to better understand the relative difficulties of different processes and the relative costs and prospects for future developments.

The last chapter is perhaps the most valuable of all, although it is not about crystal growth *per se*, but rather about the causes of color in gemstones. Although perhaps tedious for the nonscientifically inclined, the diligent jeweler will find it (aside from Dr. Nassau's article in the October, 1980 *Scientific American*) to be the best and only detailed explanation for the layman of color in gemstones as explained by modern physics. Nassau has a great gift for making the most complex ideas from modern physics understandable to laymen. He explains an astounding 12 different causes of color in gemstones. Even if one skipped the other 25 chapters, this chapter alone would earn this excellent book a place on the shelf of the serious jeweler/craftsman in spite of the rather stiff price.

Nassau's book has only one serious competitor in English: *Man-Made Gems* by Dr. Dennis Elwell, 191 pages, numerous illustrations, including nine pages of color, John Wiley and Sons, New York, 1979, $44.95, which is also an excellent book and can also be recommended on the basis of its content if not its cost.
—Si Frazier

Der Gold- und Silberschmied, Werkstoffe und Materialen by Jochem Wolters, Ruhle-Diebener-Verlag Gmbh & Co. KG., Germany, dm 54.00, hardcover—plastic laminate. Available from: Hannelore Gabriel, SNAG Book Department, Box 175, Madison, OH 44057, $24.00, including members' discount and postage

Written with the proverbial German *grundlichkeit* (thoroughness, profoundness), this reference work comes as a relief from the plethora of books of the genre of "make your own jewelry in three easy steps, preferably of found objects." This is not a how-to book, though, but an introduction to working materials and chemical substances aimed at the professional, teacher and researcher. It is the first volume in a series on gold- and silversmithing yet to be published, which, judging by this volume, promises to be the best foundation of theoretical knowledge for the metalsmith currently available. Pictorial material in black and white for this purely technical subject is lavish and illustrative.

The book is available only in the original German—fragments of high-school German would not be sufficient to decipher this scientific work. However, an English translation is probable. Moreover, an informed reading of this work requires a knowledge of chemistry and physics. Wolters has done more than his homework. Every page shows that the subject was thoroughly researched. The bibliography lists 1052 references.

Usually an introduction to working materials for the metalsmith begins with metals and metallurgy. This work leaves that to the second chapter, going one step deeper, giving a basic introduction to atomic and solid-state physics. The section on metallurgy, like other sections throughout the book, is thoroughly illustrated with charts and photographs. Metals are treated in depth from every aspect, for example, 23 pages are dedicated to gold and its alloys. Wolters charts the chemical formulae of different-colored gold alloys (purple and blue, for example). Unfortunately, he omits specific proportions under nonprecious metals, although many more are treated than normal, for example, lithium. Evidently the great titanium wave had not hit central Europe when Wolters did his research on his book. Titanium is briefly treated; other refractory metals are omitted entirely.

Among the nonmetallic working materials, we find the familiar woods, ivories and shells, descriptions of elephant hair, deer teeth and a more esoteric substance, bezoar stone (something that grows in the stomachs of capra hircus, a goat of Asia Minor). In addition there is a good amount of information on epoxies and plastics. Almost half of the book deals with chemicals and gases used by metalsmiths, which goes far beyond the usual information available. Another section describes materials for certain tools, such as polishing brushes or tool handles.
—Hannelore Gabriel

Many books reviewed here may be ordered at a discount through the Society of North American Goldsmith's Book Department. For further information and a list of available titles, write Glenice Matthews, 513 Everett St., Wichita, KS 67213.

Metalcrafters Supply Co. Inc.

One Rear Concord Rd., Sudbury, Mass. 01776
Tel. 443-3752

JEWELRY MAKING SUPPLIES

Precious Metals
Tools, Equipment, Supplies
Stones, Beads, Findings
Books

ENAMELING SUPPLIES

Enamel Colors–Domestic and imported
Copper, Bowls, Fine Silver, Cloisonne Wire
Kilns, Tools, Supplies

Thompson & Schauer

CLASSIFIED

Rates: Minimum 15 words—$15. After that, $1.25 per word (abbreviations, initials count as full words). When figuring number of words, be sure to include name and address.
Payment: Full payment must accompany each order. Make checks out (in US Dollars only) to: *Metalsmith,* Classified. Mail payment and copy to: Metalsmith Classified, David Freda/Holly Hutchins, RD4, Box 388, Kallop Rd., Kingston, NY 12401.
Agency Commission: No agency commission on classified advertising.
Deadlines: Ads must be received by the first of the month, two months prior to issue date (i.e., July 1 for Fall issue; October 1 for Winter issue; January 2 for Spring issue; April 1 for Summer issue).
Accepted: Publisher reserves the right to accept or reject advertisements for *Metalsmith:* Classified at his discretion. Advertisements accepted only in the categories: Help Wanted—Apprenticeship, and Teaching Opportunities; Rentals and Sales of Studio Equipment by individual craftsmen; Tools—used or handmade and sold as a specialty by individual cratftsmen; Exchanges; Business Opportunities; Services of individual craftsmen.
Not accepted: Material and Equipment Suppliers; Gallery Announcements; Announcements of Courses by Schools and Universities; Books and Periodicals or other products or services which conflict with regular display advertising in *Metalsmith.*

Creative Metalsmiths, representing contemporary jewelry in gold and sterling, is in the process of expanding its representation of designer craftsmen. Work must be highly wearable, highly salable production work ranging in price from $25 to $250. Work on consignment with prompt payment. Fully insured with Central Station security system. Please send slides and SASE with resume. Don H. Johnson and Ben Dyer, Creative Metalsmiths, P.O. Box 732, Chapel Hill, NC 27514, 919-967-2037.

Boston Findings & Jewelers Supply

THE JEWELERS BUILDING
373 Washington St.,
Boston, Mass. 02108

FINDINGS & STONES
and all other jewelers supplies

Out of state:
800-225-2436
Mass. residents:
800-882-1226

ORNAMENT
A Quarterly of Jewelry & Personal Adornment

Definitive Articles, Reviews, Marketplace, Products, News, Identification.

Contemporary, Ancient, Ethnic and Commercial Jewelry

Costume, Fashion,
Aspects of Adornment

$16/Subscription $5/Sample Copy
Please Enclose Payment.
P.O. Box 35029-M Los Angeles, CA 90035

send
Metalsmith
as a gift

Use this coupon to give a special friend
METALSMITH MAGAZINE
YES! I want to give METALSMITH as a gift.
Please enroll my friend named below
as a subscriber at the $20.00 annual rate;
and send (him or her) the next 4 issues.

Gift from:
My name _____
Address _____
City _____ State _____ Zip _____

Gift to:
Name _____
Address _____
City _____ State _____ Zip _____

Attach a separate sheet for additional gifts
and mail with your check to:
METALSMITH MAGAZINE
2849 St. Ann Drive, Green Bay, WI 54301

UNIVERSITY OF DELAWARE
Winter Session January 3-February 5, 1983
3-credit graduate/undergraduate course in "Photofabrication"

ELEANOR MOTY
Guest Artist

January 10 & 11

For further information, write or call:
Ann Graham, Dept. of Art, 104 Recitation Hall
University of Delaware, Newark DE 19711.
(302) 738-2737 or (302) 738-2244
Free public lecture January 10 at 7:30 pm

CAN YOU DO THIS?
Why not learn!

Expand your marketable skills. Enroll in our professional/intensive courses in Stonesetting, Goldsmithing, Repair, Wax, Rendering and others. Three terms per year. Small classes. Enrollment is limited.

REVERE ACADEMY OF JEWELRY ARTS
SEND FOR FREE CATALOG
760 Market Street, Suite 937/M
San Francisco, CA 94102 415-391-4179

T. B. HAGSTOZ & SON, INC.
Refiners and Dealers● Precious Metals● Silver Solders● Craft Metals
709 SANSOM STREET, PHILADELPHIA, PA. 19106

FOR JEWELERS & CRAFTSMEN
TRY OUR 18K N.T. GOLD CLOISONNE WIRE

Casting Supplies

GOLD	FINDINGS	PEWTER
SILVER	TOOLS	SPEC. BRONZE
COPPER	WAXES	NICKEL
BRASS		SILVER

SINCE 1898 215 922- 1627 Send for free catalogue

SERENDIB GEMSTONES
Gemstones from Sri Lanka (Ceylon)
Clean, lively, recut, faceted, star and cats-eye stones
Amethyst, chrysoberyl, garnet, spinel, sapphire, others
Fine Quality • Low Prices
Free wholesale price list
Stones memoed to jewelry classes

SERENDIB
Box 4902
Berkeley, CA 94704

PENLAND SCHOOL OF CRAFTS
summer 16 weeks
2 and 3 week sessions
fall and spring sessions
8 weeks
for more information write:
penland school of crafts
penland, north carolina
28765
704/765-2359

Mark It
Finest toolsteel custom stamps of your signature, store name, hallmark, logo. Also stock quality symbols, ring stamps, etc. Ideal for stamping metal, leather, wood, plastic, or press in ceramics. Lasts for thousands of impressions!

J.Cohn STERLING BISHOP N.B.Havens 1 20 12K GF 14 KT ASPEN STAINLESS STEEL GEN. LEATHER MADE IN U.S.A.

H. A. EVERS CO., INC.
72-M Oxford St., Prov., R.I. 02905 (401) 781-4767

GEM STONES

You need them for your total jewelry program. Send for a large selection of precious & semi-precious stones. Priced for student craftsmen.

OPALS • GARNETS • STARS • LAPIS • JADE • MOONSTONES • TOURMALINE • SMOKY QUARTZ • CORAL • PEARLS and many more. Keep stones for 30 days. Send back any or all and pay for stones you want to keep. Why buy from a catalogue?

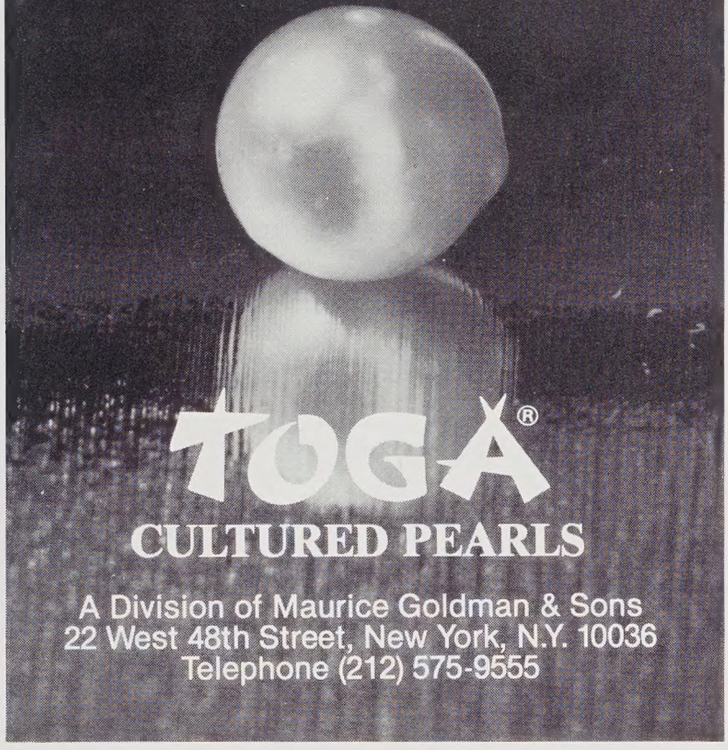
SPECIAL ORDERS AVAILABLE

SEND ORDERS ON SCHOOL STATIONERY

KENNETH F. ROSE
GEMS
P.O. BOX 84 M
SOUTHFIELD, MICH. 48037

Loose Cultured Pearls

In all sizes of loose pearls—round, baroque, fresh water pearls (BIWA pearls), South Sea pearls, singles and pairs.



TOGA®

CULTURED PEARLS

A Division of Maurice Goldman & Sons
22 West 48th Street, New York, N.Y. 10036
Telephone (212) 575-9555

The Quality Crafts Market

NATIONAL CRAFTS MARKETING SERVICE

Every issue contains important market information, surveys and reports, and exclusive contacts for buyers. For example
WHAT'S SELLING AROUND THE COUNTRY: A comprehensive survey of sales and sales trends for quality crafts retailing from $5 to $1000+, as reported to QCM by shops, galleries and department stores throughout the country
CRAFTS BUSINESS MANAGEMENT: Craftspeople, shop and gallery owners share information on pricing, purchasing, etc.
CRAFT MARKETING DIRECTORY: Wholesale source for finished craft, supplies and services, PLUS MUCH MORE...

YES, PLEASE SEND ME:

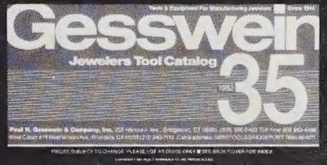
☐ ONE YEAR, $20. ☐ TWO YEARS, $35. ☐ THREE YEARS, $50.
☐ PLEASE ALSO SEND THE COMPLETE FILE OF 27 AVAILABLE BACK ISSUES SPECIAL PRICE FOR NEW SUBSCRIBERS, $47

MY NAME _____ TITLE _____
PLEASE PRINT
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
☐ MY CHECK OR MONEY ORDER IS ENCLOSED
Please charge to ☐ MASTER CARD ☐ VISA
MY CARD NUMBER _____ EXPIRES _____

THE QUALITY CRAFTS MARKET
521 FIFTH AVENUE, SUITE 1700, NEW YORK, NY 10017

Gesswein

...Jewelers' Supplies for over 65 years.



"Super-Source"
...over 3,000 items...
everything you need,
and everything of the finest
quality, all in Catalog #35.

For your FREE time and dollar saving Catalog #35, write Gesswein, Inc., 255 Hancock Ave., Bridgeport, Ct. 06605 or call 800-243-4466. In Ct. 366-5400.

Service and Confidence

Billanti Casting Co., Inc.

For 25 years, we have provided our customers with a specialized casting service. We take pride in the maximum security extended every piece regardless of the size of any order. For this reason, many designers, museums, and manufacturers entrust their creations to us.

Billanti Casting Co., Inc.
64 West 48 Street
New York, NY 10036

Telephone: (212) 586-8553

Gold Silver Bronze
Brass Copper
Silicone Molds Rubber Molds

for the ARTIST & CRAFTSMAN ooo

REACTIVE METALS SUPPLY COMPANY

- TITANIUM— Sheet-Bright, Annealed Wire & Tubing
- NIOBIUM
- TANTALUM

Write for Catalogue & wants:
RMS o P.O. Box 2191 o Lawrence, KS 66045

JEWELRY MOLD MANUFACTURING CO.

HIGHEST QUALITY
RUBBER MOLDS & WAX DUPLICATES
YEARS EXPERIENCE:
JEWELRY INDUSTRY PRODUCTION • MOLD MAKING
UNIVERSITY METAL DEPARTMENT TEACHING

- 20% DISCOUNT ON FIRST ORDER—THRU 1982
- FREE ESTIMATES
- NO OBLIGATION
- CONTACT: PAULETTE MYERS 1-314-849-3334

MAILING ADDRESS:
JEWELRY MOLD
MANUFACTURING CO.
P.O. BOX 8627
ST. LOUIS, MISSOURI 63126

ANCHOR
TOOL and SUPPLY CO. INC.
FINE TOOLS for CRAFTSMEN

TOOLS AND SUPPLIES FOR:
GOLD AND SILVERSMITHING •
CASTING • PLATING •
FINDINGS • ENAMELS •
SEPPA SINUSOIDAL STAKES •
BLACKSMITHS TOOLS

Send $2.00 (refundable on first order of $10.00) for our illustrated new catalog

ANCHOR TOOL AND SUPPLY COMPANY, INC.
231 MAIN STREET (Route 24) CHATHAM, N.J. 07928
Telephone: (201) 635-2094

OVER THE COUNTER STORE HOURS: TUESDAY THRU FRIDAY 1-5 P.M.,
SATURDAYS 10-1 P.M., OR BY APPOINTMENT

THIS COUPON CAN MAKE A BIG DIFFERENCE IN YOUR LIFE

If you are not already a regular reader of THE CRAFTS REPORT, now is the time to join thousands of the country's finest professional craftspeople, shop and gallery owners, teachers, show managers, and crafts administrators who stay on top of the news and information that makes their lives more successful and rewarding. All the news and activities of the contemporary crafts world.

Every issue is packed with valuable information: how to sell, where to sell, how to save on taxes, how to manage the "business side" of your craft activities, how other craftspeople do it, how to earn a better living in crafts.

All of this is designed to take the hassles out of the "business side" of your life so that you can devote more time to your craft work and less time to your paperwork.

Discover what other readers have found — as few as two or three good sales contacts through the "Crafts Wanted" or "Crafts Available" sections and you have your subscription investment back many times over. Every year you'll see literally hundreds of solid money-making or money-saving opportunities you find nowhere else but in THE CRAFTS REPORT, the only monthly newspaper in the crafts field.

THE CRAFTS REPORT
700 Orange St., PO Box 1992, Wilmington, DE 19899 MS

YES! Please send THE CRAFTS REPORT regularly every month. Enclosed is my check for

☐ $15.75 one year (11 issues)
☐ $29.00 two years (22 issues)

Name _____

Business Name (if any) _____

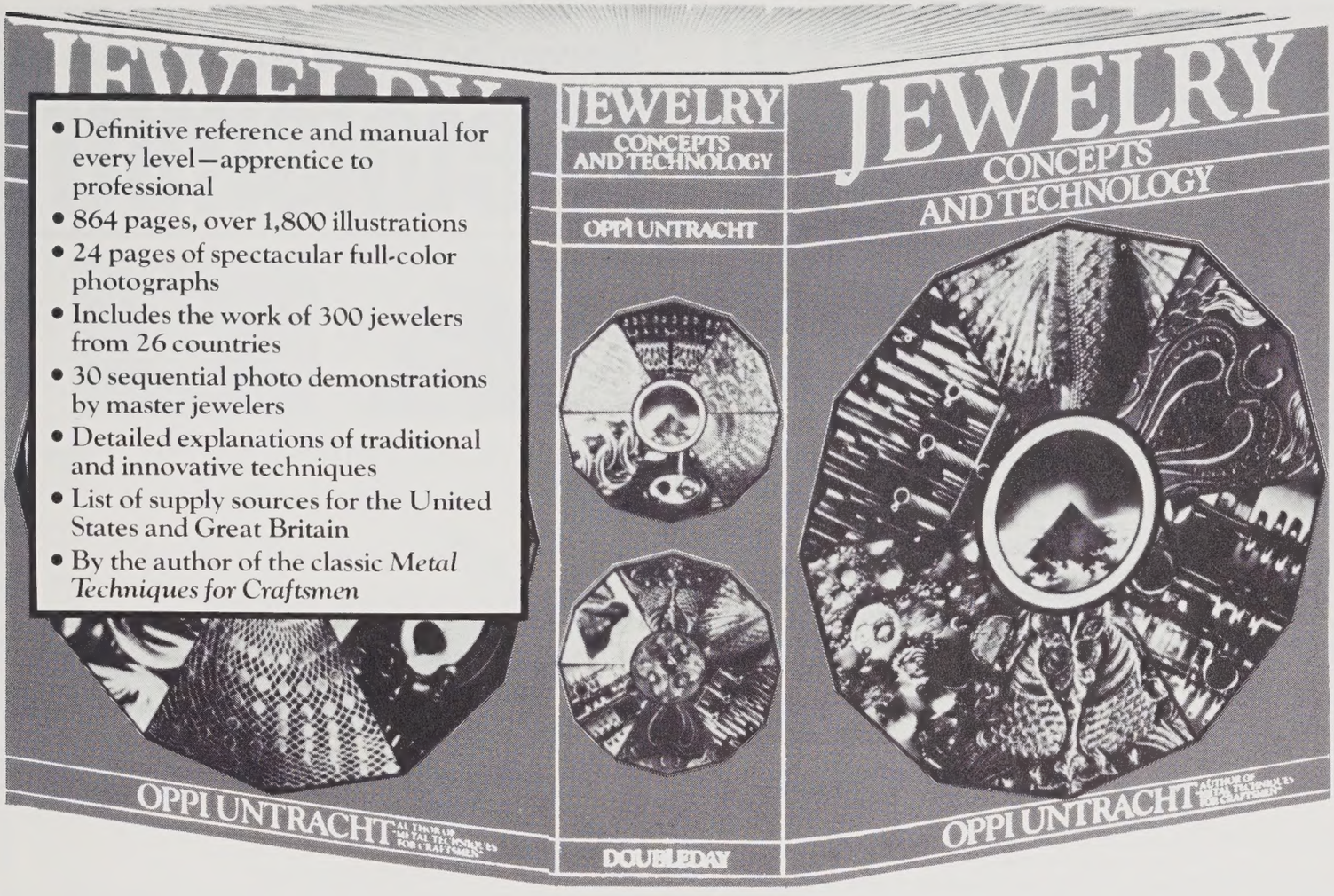
Address _____

City _____ State _____ ZIP _____

GOLD
&
SILVERSMITHS

Complete selection of
TOOLS, METALS & FINDINGS
CASTING EQUIPMENT & WAXES
POLISHING MACHINES, TUMBLERS
SOLDERING SUPPLIES
GEM STONES

Send $1.00 for catalog
C.W. SOMERS & CO., Inc.
387 Washington Street
Boston, Mass. 02108
Phone: (617) 426-6880



- Definitive reference and manual for every level—apprentice to professional
- 864 pages, over 1,800 illustrations
- 24 pages of spectacular full-color photographs
- Includes the work of 300 jewelers from 26 countries
- 30 sequential photo demonstrations by master jewelers
- Detailed explanations of traditional and innovative techniques
- List of supply sources for the United States and Great Britain
- By the author of the classic *Metal Techniques for Craftsmen*

The most comprehensive, detailed guide to jewelry-making ever published

Never before has there been so creative, complete and detailed a manual on the art and craft of making jewelry. Metalworker and writer Oppi Untracht has given us a fully illustrated guide to all traditional jewelry-making techniques, plus the most innovative processes used in the creation of jewelry today. Indispensible to craftspersons, JEWELRY CONCEPTS AND TECHNOLOGY is also invaluable to jewelry collectors, historians, educators, students or anyone who might want a better understanding of the technical side of the jewelry world.

JEWELRY CONCEPTS AND TECHNOLOGY begins with the basic means of creation: the workshop, the tools, and the raw materials. It continues with in-depth coverage of every basic metal processing and finishing technique and every method of casting metal. It includes detailed discussions of the basic forms of metal used, surface ornament with and without the use of heat, stones and their settings, fabrication and metallic coating techniques. Its magnificent illustrations include 30 sequential photo demonstrations showing master jewelers working from raw materials to finished jewels.

For craftspersons at all levels of experience

The book's arrangement, with traditional, ethnic and contemporary jewelry from all parts of the world grouped by specific technical process, not only makes the guide easy to use, but also dramatically illustrates the mutual bonds between today's creative jewelers and their more tradition-dominated colleagues. The detailed text is supplemented not only by more than 1,800 photographs and illustrations, but also by an extensive index, glossaries of design concepts, jewelry forms and findings, and over 90 tables of standard weights and measures.

Among the subjects covered in depth are—

- cutting, sawing, bending and piercing
- repoussage and chasing
- filigree
- chain and chain mail
- engraving
- metal inlay
- etching
- reticulation
- fusing metal
- soldering
- creative use of the lathe
- plastics in jewelry
- casting
- gold gilding
- electroplating, electroforming and photo-electroforming
- anodizing and titanium coloring

and much, much more. JEWELRY CONCEPTS AND TECHNOLOGY is the *one* book that every craftsperson must have—as an international source of ideas and inspiration; as a specific, practical guide to techniques; as a unique illustrated survey of jewelry-making worldwide; and, most of all, as a guide and teacher at every stage of the craftsperson's development.

Use JEWELRY CONCEPTS AND TECHNOLOGY for two full weeks without obligation. If not completely satisfied within that time, simply return the book and owe nothing. At bookstores, or mail the coupon today.

NO-RISK EXAMINATION COUPON

DOUBLEDAY & COMPANY, INC.
Dept. ZA-205
Garden City, New York 11530

Please send me _____ copies of JEWELRY CONCEPTS AND TECHNOLOGY @ $50.00 per copy (after January 1, 1983, price will be $60.00). Enclosed is my check or money order. I understand you will pay all shipping and handling costs. If I don't agree that this is a book I must keep, I'll return it within two weeks for a full refund—no questions asked.

NAME_____

ADDRESS_____

CITY_____STATE_____ZIP_____

Offer expires January 1, 1983.

# of Wonderful Things No. 3

The Goodfellow Catalog

A treasury of America's finest crafts, The Goodfellow Catalog is the largest mail-order crafts catalog ever assembled, an historic document of American handcrafts, an inspirational "idea" book, indispensable as a gift or source of gifts—sure to bring endless hours of browsing pleasure. A visual feast of 1500 photographs is complemented by detailed product descriptions and absorbing personal statements from all 680 craftspeople—720 pages of wonderful things and wonderful people!

The Goodfellow Catalog No. 3—720 pages, 1500 photographs, indexes. Please send_____copies at $19.95 plus $2.50 shipping. In California, add $1.20 sales tax. Send to: The Goodfellow Catalog Press, P.O. Box 4520, Berkeley, CA 94704.

Name _____

Address _____

City, State, Zip _____

Upcoming in the Winter Issue of

Metalsmith

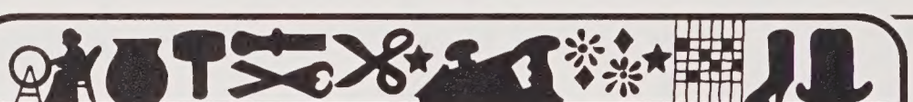
Master Metalsmith: Alma Eikerman
by Lynda LaRoche

Techniques for the Head
by Bruce Metcalf

A Metalsmith's Guide to Athens
by Anne Barros

Metal Spinning: Part One
by James Seavey

and more



We bring together the art and business of American Craft

Our Craft Fairs are your best opportunity to meet qualified wholesale buyers and knowledgeable, discerning customers. Send for more details and complete application information on specific Fairs.

THE CRAFT FAIR AT BALTIMORE · DALLAS

RHINEBECK · NEWPORT · SAN FRANCISCO

The Craft Fair at	1983 Application Deadlines	1983 Fair Dates
Baltimore	October 1, 1982	February 9-13
Dallas	November 15, 1982	March 23-27
Rhinebeck	January 7, 1983	June 20-26
Newport	January 7, 1983	July 22-24
San Francisco	March 10, 1983	August 10-14

American Craft Enterprises, Inc.

PO Box 10-M/New Paltz, NY 12561/914/255-0039

Support the only national organization dedicated to the Advancement of American Craft. Join The American Craft Council.

American Craft Council
401 Park Avenue South
New York, NY 10016

ALLCRAFT
TOOL & SUPPLY COMPANY, INC.

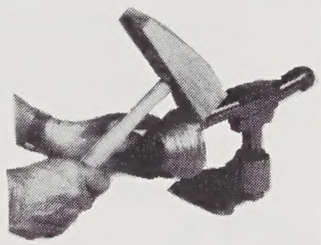
Tools and Supplies For:

- JEWELERS
- SILVERSMITHS
- METALSMITHS
- CASTERS
- DESIGNERS
- ENAMELISTS

New Catalog

OVER 160 PAGES OF UNIQUE TOOLS

25,000 Ft. Of Warehouse and Manufacturing



MAIL ORDERS and CORRESPONDENCE
100 Frank Road — Hicksville, N.Y. 11801
Phone 516 433-1660 — 212 895-0686

NEW YORK SALESROOM
22 West 48th Street — New York, N.Y. 10036
Phone 212 246-4740

CALIFORNIA SALESROOM
204 North Harbor Blvd. — Fullerton, Calif. 92632
Phone 714 870-8030 and 870-8031

Use this form to mold a career in metal.

At Boston's Museum School, our metalsmithing program takes shape in a variety of ways. We offer a wide selection of courses–including hand forming techniques, casting, enameling, plating and electroforming.

You'll learn from a faculty of practicing professional artists. And you'll have the choice of earning a BFA or BS, or enrolling in a special double-degree program through Tufts University and the Museum School.

So if you want to make your mark in metal, start by filling out this form.

Name_____

Address_____

City_____ State_____ Zip_____

Boston Museum School

230 The Fenway, Boston, MA 02115
A Department of the Museum of Fine Arts
Affiliated with Tufts University

The School of the Museum of Fine Arts admits students of any race, color and national or ethnic origin.

Metalsmith

- ☐ reviews, esthetics, criticism, profiles, surveys, essays
- ☐ written by contributors from all parts of the craft world.
- ☐ Contemporary work of leading jewelers, designers, gold- and silversmiths, enamelers, blacksmiths, and sculptors
- ☐ Recent gallery and museum exhibitions
- ☐ current work in diamonds, ivory, gold, silver, titanium, plastics . . .
- ☐ surveys of museum collections around the world

Metalsmith Subscription Form
Dept. MM, Society of North American Goldsmiths
2849 St. Ann Dr., Green Bay, WI 54301

☐ One year (4 issues) $20.00 U.S., Canada Europe plus:
☐ $6.00 Surface Mail or ☐ $15.00 Air Mail
All other countries plus:
☐ $6.00 Surface Mail or ☐ $20.00 Air Mail

☐ Amount enclosed $ _____
☐ Please bill me.
All payments must be made in U.S. dollars.
Allow 8-10 weeks for delivery.

_____
name

_____
address

_____
city/state/zip Allow 8-10 weeks for delivery.

Tools for Jewelry Making

JEWELRY TOOLS • CASTING SUPPLIES

JEWELRY FINDINGS • ENAMELS

SUPPLIES • PLATING EQUIPMENT

GOLD AND SILVER-SMITHING

Distributors for Kerr Mfg. Co. and Branson Ultrasonic Cleaners

You can get all your jewelry making supplies in one place. Please send $2.00 for catalogue which is deductible from first order of $5.00 or more. Requests on school or organization letterhead exempt.

C. R. HILL COMPANY
DEPT. GJ
2734 W. 11 MILE ROAD
BERKLEY, MICHIGAN 48072
(313) 543-1555

AMERICAN craft

the magazine that puts you in touch with the excitement of contemporary crafts. In each bimonthly issue, AMERICAN CRAFT presents distinguished master craftsmen, museum exhibitions, craft in architecture, and profiles of collections, galleries, and emerging talents.

AMERICAN CRAFT also provides a national calendar of craft exhibitions and events, book reviews, and a special news section, "Craft World."

AMERICAN CRAFT is a benefit of membership in the American Craft Council, the leading organization for crafts in this country. As a council member, you'll enjoy the additional benefits of free admission to the American Craft Museum and council library in New York City, discounts on council publications, and group insurance rates.

RECEIVE ONE FREE ISSUE PLUS A ONE-YEAR SUBSCRIPTION WITH THIS COUPON

Annual Dues: $29.50 ($33 per year outside the U.S.)
$22.00 to students with copy of current official student I.D.

Please enter my membership in the American Craft Council which includes a one-year subscription to AMERICAN CRAFT.

Name _____

Street _____

City _____ State _____ Zip _____

Amount enclosed $ _____

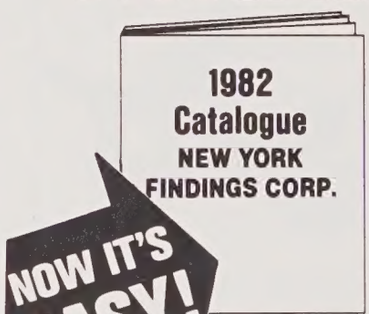
Allow 6-8 weeks to receive your first copy of AMERICAN CRAFT

Contributions are deductible within legal limits for tax purposes. Make all checks in U.S. funds payable to ACC.

Mail this form in an envelope with payment to:
American Craft Council (Membership)
P.O. Box 1308-CL, Fort Lee, N.J. 07024 9M52

Some people make finding the price harder than finding the findings.

New York Findings makes it easy. Our FREE 1982 catalogue, with our exclusive sliding price index, will give you the exact price of your order no matter what gold closes at that day! Send for your copy of our FREE catalogue now, or better yet, Call (212) 925-5745.



NOW IT'S EASY!

The 1982 New York Findings Catalogue... Don't Open Shop Without It.

New York Findings corp

72 Bowery, NY, NY 10013
(212) 925-5745
14K Findings sold by labor and gold for over 25 years.

NOTICE:

Change of Address:

The SNAG main office will now be located at 2849 St. Ann Dr., Green Bay, WI 54301. All dues, change of address, questions on *Metalsmith,* etc., should be sent to this address until further notice.

Metalsmith Papers

of the Society of North American Goldsmiths

A new publication containing 11 research topics by noted experts in the Metalsmithing profession. This first volume is 96 pages, 8½ × 11, contains 120 illustrations and diagrams, with sources of supplies & a bibliography with each research paper.

Table of Contents

Shell Structures *by Heikki Seppa.*

Application of Hot Smithing Process to Nonferrous Metals: Copper, Bronze and Brass *by Thomas R. Markusen.*

Lamination of Nonferrous Metals by Diffusion: Adaptations of the traditional Japanese technique of Mokume-Gane (Wood Gavain-metal) *by Hiroko Sato Pijanowski and Eugene M. Pijanowski*

Update: Mokume-Gane: Wood Grain Metal *by Hiroko Sato Pijanowski and Eugene M. Pijanowski.*

Practical, Inexpensive Hydraulic Pressing and Die-Forming for the Artist-Metalsmith *by Marc David Paisin.*

Aluminum: Welded and Wearable *by Marcia Lewis.*

Machine tool technology: An Aesthetic Application *by Gary S. Griffin.*

Goldsmithing Health Hazards *by Linda Weiss.*

Properties and Uses of Titanium, Zirconium, Hafnium, Niobium (Columbium) and Tantalum for the Artist-Metalsmith *by Joseph F. Hall.*

Return to the Forge: Extended Research into Mokume-Gane and Granulation *by members of the Graduate Program, Southern Illinois University/Carbondale: Marvin Jensen, Phil Baldwin, Steve Brunst, Laurie Van Houten, William Ard, Janice Nathen, Randy Jones, Professor L. Brant Kington and Professor Richard Mawdsley; compiled and edited by William Ard.*

Granulation: Part Two.

Perforation of Nickel Silver *by Paulette Myers.*

To Order: Send $12.00* plus $3.00 for postage and handling, a total of $15.00 to:

SNAG: Research Papers
2849 St. Ann Dr.
Green Bay, WI 54301

Make checks payable to: Snag Research Papers. (U.S. Dollars only). *Outside U.S. write for price quote of mail rate.

GOLDSMITH JOURNAL

Back Issue Package

3 Different Packages of 5 Back Issues of the "Goldsmith Journal" at 20% off usual price.

Set No. 1: 11 through 15
Set No. 2: 16, 18, 19, 20, 21
Set No. 3: 22, 23, 24, 25, 28

(Note: Some issues are no longer available)

One Time Offer:

$4.00 per issue = $20.00 per package
$ 5.00 postage & handling*
$25.00 total
(US Dollars Only)

*Outside USA write for price on postage & handling

Excellent additions to your Metalsmithing Library. Regrettably, SNAG does not plan to reprint back issues. There are less than 100 remaining of some issues.

Each issue of the "Goldsmith Journal" includes Technical Articles, Historical Documentations, Exhibition Reviews, Health Hazard Information, etc., etc.

Send Orders to:

SNAG: Back Issue Offer
2849 St. Ann Dr.
Green Bay, WI 54301

Make checks payable to:
SNAG: Back Issue

D. J. S. Co.

+DISCOUNT PRICES ON
+JEWELERS TOOLS AND
+SUPPLIES INCLUDING:
METALS, HARD TOOLS,
CASTING MACHINES, WAX
INVESTMENTS, ENAMELS,
SEMI-PRECIOUS STONES.

For a Catalog Folder
of Bargains send $2.00
and your address to:

Del. Jewelers Supply
1114 GREENTREE ROAD
NEWARK, DELAWARE 19713

METALSMITHING *at Peters Valley*

Fall Faculty:

1. *October 2 and 3*
   Jaclyn Davidson—Wax Work
2. *October 9, 10 and 11*
   Barbara Satterfield—Limoges/Basse-taille
3. *October 16 and 17*
   Gayle Saunders—Mixed Metals
4. *October 23 and 24*
   Robert Davis—3-D Overlay
5. *October 30 and 31*
   Michael Lieber—Studio Mokume

call or write for information:
Peters Valley, Layton, NJ 07851(201)948-5200

METALS, FIBERS CLAY AND GLASS AT **PARSONS**

Join the thousands of New Yorkers who are building their skills and careers at the college that has set the standard for design education for more than 85 years: Parsons. Workshops and courses are offered for credit or non-credit in the disciplines of metal, clay, fibers, glass and wood.

Classes are taught by a distinguished faculty including: Marilyn Dintenfass, David Gill, Markku V. Piri, Alfred Durante, Peter Mroczkowski and Albinas Elskus. Classes meet in specially designed studios unsurpassed in the New York area.

For more information on the Crafts Program, please call or write Mary Ann Scherr, Director of Metals, Fibers, Clay and Glass at:

Parsons School of Design
66 Fifth Avenue
New York, N.Y. 10011
(212) 741-8668

THE WORCESTER CRAFT CENTER

25 SAGAMORE ROAD
WORCESTER
MASSACHUSETTS
01605
(617) 753-8183

Professional Craft Studies*

- **WOOD**
- **FIBERS**
- **CLAY**
- **METAL**

*a 2-year program for career-oriented craft students

call or write for a descriptive brochure

Thompson Enamel
a division of Ceramic Coating Co.

your complete source for
Enameling Supplies

FOR:
METALSMITHS
JEWELERS

Please send catalog (Price $3.00) to:

Name

Address

City

State/Zip

Thompson Enamel
1539 Old Deerfield Road
P.O. Box 127, Highland Park, IL 60035

Metalsmith

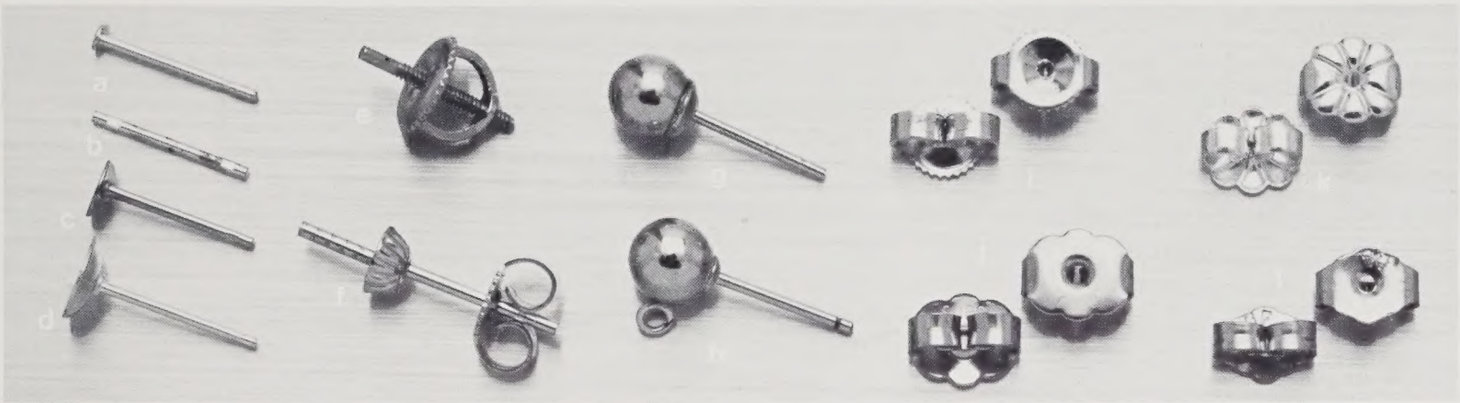
Back Issues

Order your copies now!

Volume one, Number one Fall/80	$5.00
Volume one, Number two Winter/81	$5.00
Volume two, Number two Spring/82	$5.00

Add $1 postage and handling for each copy ordered.

Make checks payable to *Metalsmith Magazine* and enclose with your order to:
Metalsmith; Dept. MM
Society of North American Goldsmiths
2849 St. Ann Drive
Green Bay, WI 54301



Earposts

Sterling Silver	10	100	1000	10,000
a. U660-030 1mm pad	$1.00	$2.84	$24.38	$229.13
b. U660-033 double notch	1.00	2.75	23.55	221.38
c. U660-032 3mm pad	2.06	18.28	156.85	1,474.13
d. U660-031 5mm cup pad	2.19	19.41	166.52	1,565.00
Surgical Steel		**100**	**1000**	**10,000**
a. U661-020 1mm pad		$2.00	$3.19	$30.00
b. U661-021 double notch		2.00	3.19	30.00
c. U661-022 3½mm pad		2.90	24.90	234.00
Gold Filled		**10**	**100**	**1000**
a. U663-005 1mm pad		$1.00	$3.04	$26.09
14K Gold		**ea.**	**10**	**100**
a. U670-020 1mm pad, 14KY		$ .86	$7.75	$67.13
b. U670-030 double notch, 14KY		.68	6.03	56.68
c. U670-021 4mm cup, 14KY		1.74	15.38	144.59
e. U670-055 screw earnut, 14KY		6.40	56.78	533.65
e. U670-056 screw earnut, 14KW		6.49	57.53	540.72
f. U670-037 4mm pearl cup, 14KY		6.21	55.07	517.62

Earwires

Sterling Silver	10	100	1000
a. U660-000 Hvy.	$1.00	$5.64	$48.40
a. U660-001 Lt.	1.00	4.81	41.29
b. U660-010 Beaded	1.75	15.51	133.08
Base Metal	**10**	**100**	**1000**
a. U661-005 Surg. Steel	$1.00	$2.00	$3.33
a. U663-000 Gold Filled	1.00	7.96	68.32
14K Gold	**ea.**	**10**	**100**
a. U670-000 White	$1.88	$16.64	$156.40
a. U670-010 Yellow	1.62	14.40	135.33
b. U670-001 Yellow	9.62	85.30	801.67

Ear Screws

Sterling Silver	ea.	10	100
j. U660-060 w/5mm pad	$1.21	$10.90	$96.67
k. U660-050 w/7mm ½ ball	1.15	10.34	91.71
14K Gold	**ea.**	**10**	**100**
h. U670-070 Yellow	$14.21	$125.95	$1,183.76
i. U670-071 Yellow	10.81	95.81	900.50

Posts with Balls

Sterling Silver	ea.	10	100	1000
h. U660-038 3mm	$ .60	$4.68	$41.41	$355.31
h. U660-040 4mm	.74	5.78	51.21	439.45
h. U660-042 5mm	.80	6.23	55.15	473.26
Gold Overlay	**ea.**	**10**	**100**	**1000**
h. U663-012 3mm	$ .75	$5.80	$51.33	$440.43
h. U663-014 4mm	.90	6.97	61.70	529.38
h. U663-016 5mm	1.08	8.41	74.46	638.94
14K Gold		**ea.**	**10**	**100**
g. U670-066 Yellow 5mm		$4.54	$40.27	$378.51
g. U670-068 Yellow 4mm		3.34	29.62	278.37
h. U670-022 Yellow 3mm		3.32	29.46	276.88
h. U670-023 Yellow 4mm		4.15	36.75	345.44
h. U670-024 Yellow 5mm		5.27	46.77	439.58

IMPORTANT: Prices are based on an $8.50 Silver and $450.00 Gold market. All orders are billed at the market of the day filled.

Ear Nuts

Sterling Silver	10	100	1000	10,000
k. U660-020 Hvy.	$2.46	$21.76	$186.76	$1,755.23
l. U660-021 Lgt.	1.00	5.63	48.28	453.75
Surg. Steel/Gold Overlay	**10**	**100**	**1000**	**10,000**
l. U661-030 S.S. Lgt.	$1.00	$2.00	$3.99	$37.50
l. U661-031 S.S. Hvy.	1.00	2.00	5.99	56.25
j. U663-010 G.O.	1.17	10.40	89.22	—
14K Gold		**ea.**	**10**	**100**
i. U670-031 Yellow Lgt.		$1.98	$17.58	$165.21
i. U670-032 Yellow Hvy.		3.79	33.60	315.80
i. U670-033 Yellow Med.		2.65	23.52	221.04
i. U670-034 White Lgt.		2.06	18.30	171.98

Low Cost Ball Posts with Dangle

U661-010

Surgical Steel with Sterling Silver Plate

100	1000	10,000
$3.05	$26.20	$246.25

French Earwires

Sterling Silver	10	100
c. U660-003	$1.26	$11.15
d. U660-002	1.03	9.08
Surgical Steel	**10**	**100**
c. U661-007	$1.00	$2.00
d. U661-006	1.00	2.00

Ear Clips

Sterling Silver	10	100	1000
f. U660-070 6.5mm 1/2 ball	$11.86	$105.15	$988.28
Surgical Steel	**10**	**100**	**1000**
f. U661-040 Nickel plated	$1.00	$2.58	$22.17
14K Yellow Gold	**ea.**	**10**	**100**
e. U670-077 w/pad	$18.46	$163.65	$1,538.07
f. U670-075 1/2 ball	24.35	215.93	2,029.41
g. U670-076	18.07	160.26	1,506.18

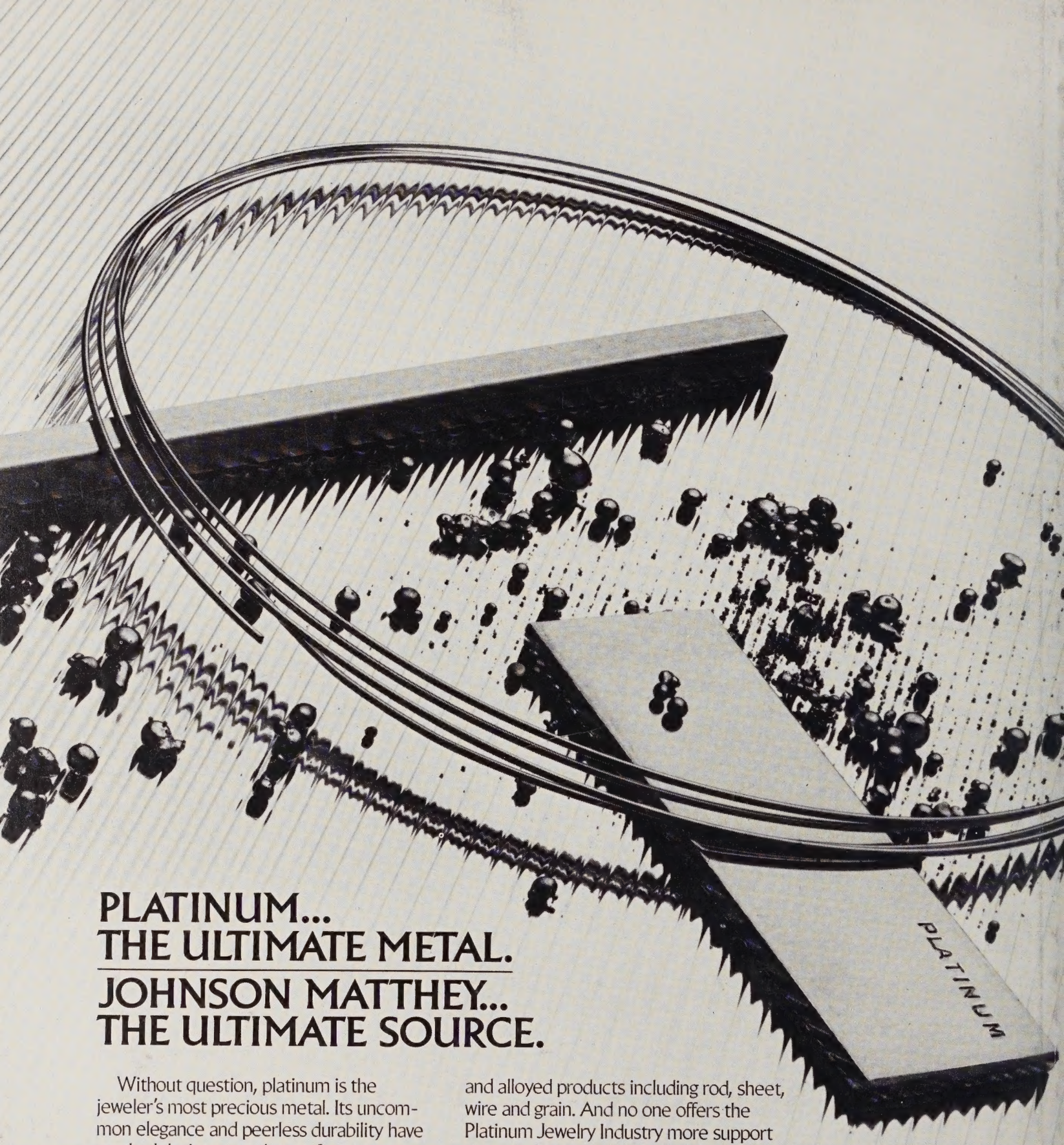
Free Catalog
Upon Request

We're All Ears!

rio grande
JEWELERS SUPPLY inc

ORDER TOLL FREE
$20.00 Minimum Orders Only Please
MasterCard 1-800-545-6566 VISA
8:30-5:30 M.T. Mon.-Fri.

6901 Washington N.E.
Albuquerque, N.M. 87109



PLATINUM... THE ULTIMATE METAL.

JOHNSON MATTHEY... THE ULTIMATE SOURCE.

Without question, platinum is the jeweler's most precious metal. Its uncommon elegance and peerless durability have sparked designers and manufacturers to create outstanding jewelry for years. And it has been used to enhance and protect some of the world's most remarkable gemstones. Let platinum help you create your own distinctive jewelry. As the sole marketing agents of the world's largest platinum mine, Johnson Matthey is the most reliable source of a broad line of pure metal and alloyed products including rod, sheet, wire and grain. And no one offers the Platinum Jewelry Industry more support through design competitions, workshops, technical support, and consumer awareness programs. For more information and a copy of our new brochure, "Platinum, The Ultimate Alternative for Jewelry," contact us at Johnson Matthey, 608 5th Avenue, New York, NY 10020, tel.: (212) 245-6790.

JOHNSON MATTHEY